

ENCOUNTER 2002 EXPEDITION TO THE ISLES OF ST FRANCIS,
SOUTH AUSTRALIA: ANNOTATED LIST OF SHALLOW WATER HYDROIDS
WITH DESCRIPTION OF A NEW SPECIES OF *CAMPANULARIA*

by J. E. WATSON¹

Summary

WATSON, J. E., Encounter 2002 expedition to the Isles of St Francis, South Australia. Annotated list of shallow water Hydroids with description of a new species of *Campanularia*. *Trans. R. Soc. S. Aust.* 127(2), 243-263, 28 November, 2003.

Forty-five species including one new species are recorded. The hydroid fauna of shallow coastal reef surrounding St Francis Island to a depth of 25 m is predominantly cryptic due to exposure to wave action and mechanical abrasion from algal stipes in the thick algal forest and grazing by fish. Favoured substrates are small red algal species, the brown fucoid *Sargassum*, the solitary ascidian *Herdmantia momus*, sponges and seagrasses. Larger aglaopheniid species and *Salanderia fusca* were epilithic, growing in sheltered caverns and on rock walls. Fifty eight percent of the hydroids recorded are endemic to Australia, 30% have a southern hemisphere distribution and 9% are cosmopolitan.

KEY WORDS: Nuyts Archipelago; southern Australia; algal forest; shallow water cryptic hydroid assemblage

Introduction

Hydroids were collected at St Francis Island in the Nuyts Archipelago (32° 30' S, 133° 17' 24" E) in the Great Australian Bight, 40 nautical miles south of the Australian mainland. The expedition was part of "Encounter 2002" celebrating the meeting in April 1802 in South Australia of the British cartographer and explorer, Matthew Flinders R.N. in H.M.S. *Investigator* and the French scientist-explorer Nicholas Baudin, commanding the *Geographe* and *Naturaliste* (Robinson *et al.* 2003).

During the 10 days of the expedition in February 2002, hydroids were collected from the northern and western coasts of St Francis Island and from two smaller adjacent islands to depths of 28 m by the author using SCUBA, and from two dredgings in deeper water.

The rocky coast of St Francis Island slopes steeply from high water mark to a sandy bottom at 10 - 28 m depth according to site. The sublittoral reef consists of large blocky boulders with vertical faces, small caverns and some larger caves. The reefs are exposed to long-fetch southern ocean swells and heavy wind-generated seas and support an abundant algal flora dominated by large brown kelps and fucoids with an understory of red algal species (Shepherd & Womersley 1976). The sandy bed out from the reef is colonised mainly by the seagrasses, *Posidonia* spp. and *Amphibolis* spp.

Of the 45 species recorded, one species is new and three could not be confidently identified to species.

Because of the similarity of the hydroid fauna of St Francis Island to that of Pearson Island in the eastern Great Australian Bight (see Watson 1973) most species are listed with a brief synonymy and pertinent remarks. Voucher and type material are lodged in the South Australian Museum (SAM 11) and Museum of Victoria (MV F).

Methods

With the exception of two dredgings (27 m and 37 m deep, see locality data) all material was collected by the author using SCUBA. Where possible, specimens were photographed *in situ* before removal from the substrate. Specimens were preserved in 10% formal on board boat. In the laboratory material was sorted under stereo-microscope preparatory to identification to species. Specimens needing more detailed examination were prepared as permanent microslide mounts in malinol.

Systematic Account

Anthothecatae

Tubulariidae Allman, 1864

Ralpharia magnifica Watson, 1980

Ralpharia magnifica Watson, 1980: 54, figs 1-24.

Specimens examined

SAM H1331, depth 5 - 17 m, coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Sparse fertile colonies, each consisting of a few scattered hydrocauli growing in crevices protected from surge. Stems to 70 mm high, living hydranth to 15 mm across extended aboral tentacles. Colonies in

an obligatory association with an alcyonacean encrusting the hydroid and hydrocaulus. Re-examination of a hydroid from Pearson Island, held in the Museum of Victoria, identified as *Tubularia larynx* (Ellis & Solander, 1786) by Watson (1973) shows the material to be a small specimen of *Ralphortia magnifica*.

Distribution

Endemic to southern Australia.

Eudendriidae Ehrenberg, 1834

Eudendrium currumbense Watson, 1985

Eudendrium currumbense Watson, 1985: 209, figs 80-83.

Specimens examined

SAM H11332, depths 5 m and 27 m, coll: J.L. Watson, Feb. 2002, material alcohol preserved.

Remarks

Several small infertile colonies growing on sponge and the solitary ascidian *Herdmania momus* in sheltered caverns. Largest colony 30 mm high and lightly fasciated, other colonies shorter and monosiphonic. Cnidome consisting of undischarged microbasic euryteles and heteronemes similar to those of *Eudendrium currumbense*. While the more robust habit and fasciculation of one of the colonies suggest it is most likely *E. currumbense*, it may possibly be a similar species, *Eudendrium aylingae* Watson, 1980.

Distribution

If the identity is correct, this is the first record of *E. currumbense* from southern Australia. Previously known only from southern Queensland (Watson 1980: 2002).

Solanderiidae Marshall, 1892

Solanderia fusca (Gray, 1868)

Ceratella fusca Gray, 1868: 579, fig. 2.- Bale, 1884: 48.- Von Lendenfeld, 1885: 612, 631.- Brazier, 1887: 575.- Bale, 1888: 745, 748.- Whitelegge, 1889: 192.- Spencer, 1892: 8, 20, pls 2, 3, 3a.- Hickson, 1903: 113-115.- Hartlaub, 1905: 515.- Vervoort, 1962: 532.

Solanderia fusca - Jäderholm, 1896: 6.- Stechow, 1909: 41.- Briggs, 1918: 33.- Pennycook, 1959: 159.- Vervoort, 1962: 532.- Vervoort, 1966: 387.- Watson & Utinomi, 1971: 19, pl. 8.- Watson, 1973: 159.- Watson, 1982: 86, fig. 4 6d, pl. 8.1.- Bouillon *et al.*, 1992: 7.- Watson, 1996: 78

Specimens examined

SAM H11333, depth 10 m, coll: J.L. Watson, Feb. 2002, material alcohol preserved.

Remarks

Fan-shaped colony 200 mm high and 100 mm wide, growing on rock wall. Capitulate tentacles emerging from trabeculate skeletal meshwork. Colony abundantly fertile, gonophores borne on a short naked pedicel emerging from meshwork; gonophores spherical, with a small apical pad armed with nematocysts: sex of gonophores indeterminate. Perisarc honey brown, hydranths and gonophores white. Common in sheltered crevices and caverns at St Francis I. and in southern Australian oceanic shell waters generally (Watson pers. obs.).

Distribution

Temperate and cool temperate Australia.

Leptothecatae

Lafoeidae A. Agassiz, 1865

Filellum antarcticum (Hartlaub, 1904)

Reticularia antarctica - Totton, 1930: 160, fig. 17.- Briggs, 1939: 26.- Watson, 1973: 163.

Filellum antarcticum - Stechow, 1925: 214.- Namtov & Stepanjants, 1962: 74.- Millard, 1975: 177, fig. 58G-H.- Stepanjants, 1979: 49, pl. 8 fig. 7.- El Beshbeeshy, 1991: 74, fig. 16.- Blanco, 1994: 189.- Watson, 1996: 78.- Genzano & Zamponi, 1997: 290.- Peña Cantero *et al.*, 1998: 300.

Specimens examined

SAM H11337, depth 3 m, coll: J.L. Watson, Feb. 2002, material alcohol preserved.

Remarks

Two small, infertile colonies creeping on lower stems of aglaopheniid hydroid. Colour of hydranths, yellow.

Distribution

Southern Australia and southern hemisphere generally.

Haleciidae Hincks, 1868

Hydrodendron armatum (Stechow, 1925)

Phylactotheca armata - Stechow, 1925: 204, fig. C.- Blackburn, 1938: 323.- Blackburn, 1942: 106.- Hodgson, 1950: 17, fig. 31.- Watson, 1973: 166.- Watson, 1975: 164, fig. 19.- Harris, 1990: 247, fig. 11.4a.

Ophioidissa armata - Totton, 1930: 142, fig. 2b.

Diphlocyathus armata - Leloup, 1940: 5

Ophiacetes armatus - Stepanjants, 1979: 110, pl. 21 figs. 2A-B.

Hydrodendron armata - Ralph, 1958: 341, fig. 13d-i, 14b-d.- Rho & Park, 1983: 42, pl. 2, figs 4-5, pl. 3, figs 1-2.- Park, 1990: 77.

Hydrodendron armatum - Rees & Vervoort, 1987: 21. - Watson, 1994: 66. - Watson, 1996: 78. - Watson, 1997: 517.

Specimen examined

SAM H1334, depth 37 m, dredge, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A small infertile colony on thallus of the brown alga *Sargassum*. The species is easily recognisable by its wide, flat hydrorhiza with strong internal flexion joints.

Distribution

Southern Australia.

Hydrodendron australe (Bale, 1919)

Ophiocles australis Bale, 1919: 336, pl. 16 fig. 1. - Watson, 1973: 165. - Watson, 1982: 1; 94, fig. 4.8a-e, pl. 8,6. - Ralph, 1958: 344. - Rees & Vervoort, 1987: 21. Stranks, 1993: 6. - Watson, 1994: 66. - Watson, 1996: 78. - Watson, 1997: 517.

Specimens examined

SAM H1335, depth 9 - 27 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Abundant infertile colonies consisting of many stems to 40 mm long on sponges and on the ascidian *Herdmannia momus* in sheltered caverns and in the open in deeper water. Many strongly fasciated stems arise from a matted hydrorhiza. The species is easily recognised by its greyish-black hydranths, due to zooxanthellae in the base of the tentacles and distributed throughout the coenosare. *H. australe* was the most widely distributed and abundant species at St Francis Is.

Distribution

Southern Australia.

Hydrodendron daidalum (Watson, 1969)

Scyresia daidala Watson, 1969: 112, figs 1-7, pl. 1. - Watson, 1979: 234. - Watson, 1982: 92, fig. 4.71. - Stranks, 1993: 6.

Hydrodendron daidalum - Rees & Vervoort, 1987: 22. - Watson 2002: 340, fig. 1F.

Specimen examined

SAM H1336, depth 27 m (dredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Infertile colony creeping on the small brown alga *Zonaria crenata*. *Hydrodendron daidalum* is an obligate epiphyte of *Z. crenata* (Watson 1969).

Distribution

South Australia (type locality) and Australian east coast to southern Queensland (Watson 2002).

Halecium delicatulum Coughtrey, 1876

Halecium delicatulum Coughtrey, 1876a: 26, pl. 3, figs 4-5. - Bale, 1924: 235. - Ralph, 1958: 334, figs 11e, h-n, 12 a-p. - Pennycook, 1959: 173. - Ralph, 1966: 158. - Vervoort, 1972: 27, figs 4-5. - Watson, 1973: 166. - Leloup, 1974: 10. - Millard, 1975: 145, fig. 471-1. - Watson, 1975: 159. - Millard, 1978: 193. - Watson, 1979: 234. - Watson, 1982: 94, fig. 4.8d-f. - Hirohito, 1983: 5. 11. - Rho & Park, 1983: 41, pl. 2 figs 1-3. - Rees & Vervoort, 1987: 25, fig. 5. - Roca, 1987: 209. - Staples & Watson: 218. - Gili Vervoort & Pagès, 1989: 78, fig. 713. - Genzano, 1990: 38, figs 2-5. - Park, 1991: 544. - Peña Cantero, 1991: 44, pl. 1. - Genzano & Zamponi, 1992: 40, fig. 17. - Park, 1992: 286. - Ramil & Vervoort, 1992: 82, fig. 20a-e. - Blanco, 1994: 186. - Watson, 1994: 66. - Hirohito, 1995: 20, fig. 5a-e, pl. 1 fig. C. - Migotto, 1996: 30, 122, fig. 6d-e. - Peña Cantero & Garefa Carrascosa, 1996: 9, fig. 1A-D. - Watson, 1996: 78. - Watson, 1997: 513. - Medel *et al.*, 1998: 31, fig. 1. - Medel & Vervoort, 2000: 12.

Specimens examined

SAM H1364, depth 10 m and 37 m (dredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Small colonies, some fertile, on *Sargassum* holdfasts, algal fragments, small sponges, the ascidian *Herdmannia momus* and on lower stems of *Gymnangium*. Stems short, to 5 mm long, unfasciated; male gonothecae borne on hydrorhizae and hydrocauli

Distribution

Circumglobal in tropical and temperate waters (Watson 1997)

Halecium sp.
Fig. 1A-D

Specimen examined

SAM H1365, depth 27 m (dredge) coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Description

A small female colony of a few scattered stems

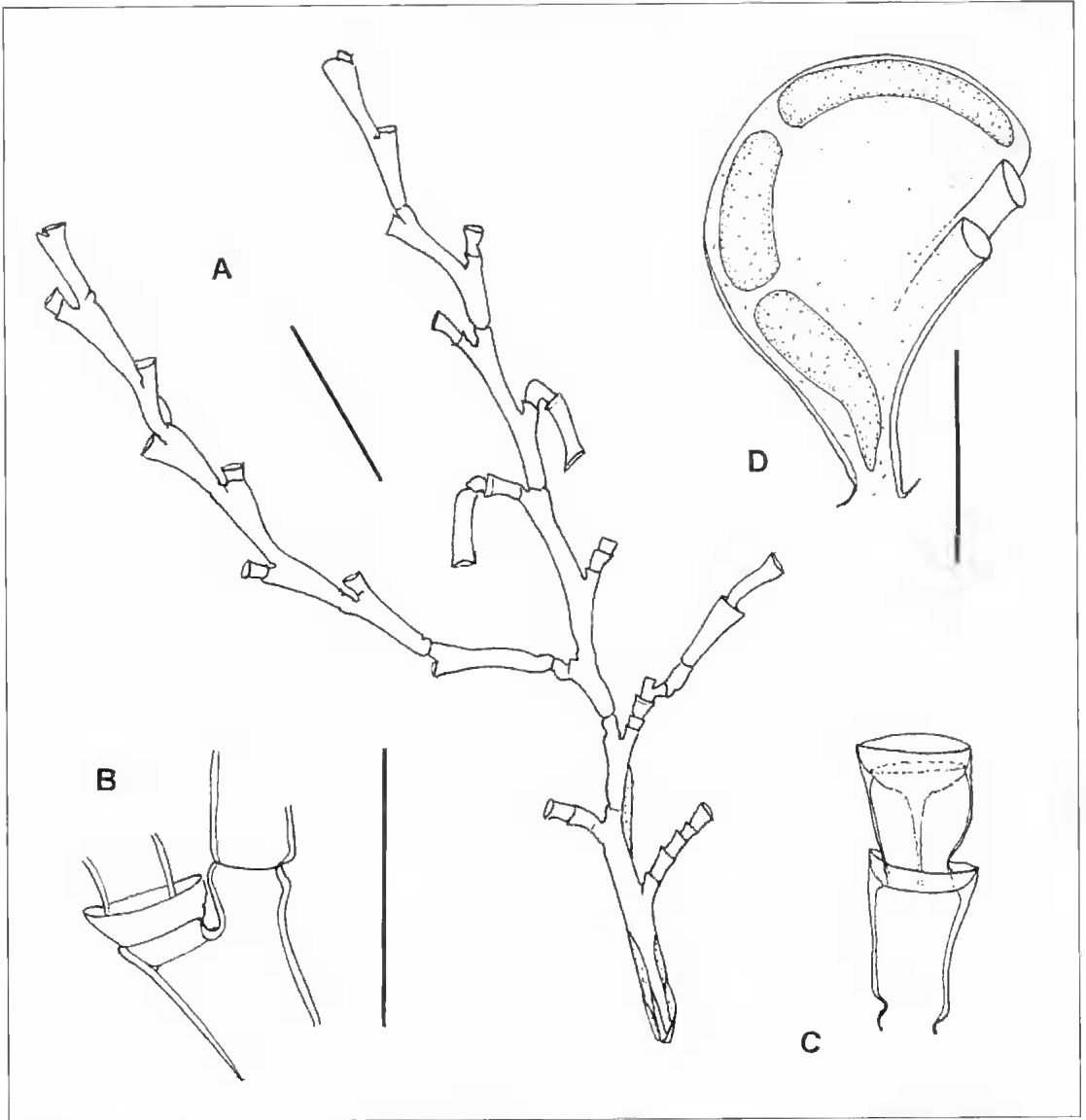


Fig. 1. A-D. *Halecium* sp. A, lightly fasciated stem from colony. B, part of stem internode showing node and primary hydrophore. C, second hydrophore of linear series showing saucer-shaped hydrothecal diaphragm and desmocytes. D, gonotheca, probably immature. Scale bars: A, 1 mm; B, C, 0.3 mm; D, 0.5 mm.

arising from a hydrothiza creeping on a red alga. Tallest stem c. 5 mm high, sparsely branched, lightly fasciated by two supplementary tubes extending for a short distance above base; other stems shorter, monosiphonic, unbranched. Stem internodes fairly long, smooth, expanding distally to hydrophore; nodes faint to distinct, almost transverse to oblique, just above level and sloping away from primary hydrophore, a tumescence in perisarc above and below node. Primary hydrophore adpressed to but not adnate to internode, some hydrophores in a linear

series of up to five, each arising from diaphragm of preceding hydrotheca. Secondary hydrophores forming basis of branches, given off almost perpendicularly on a short internode below hydrotheca of primary hydrophore. Hydrotheca fairly shallow, expanding a little from diaphragm to margin; margin circular, not everted. Diaphragm saucer-shaped in youngest hydrothecae, invisible in others, a ring of desmocytes above, a distinct thickening of hydrothecal wall at junction of diaphragm with wall.

Hydranth robust, with 20 - 24 tentacles set with large nematocysts (none discharged).

Female gonothecae balloon-shaped, laterally flattened, arising without true pedicel from within hydrophores on lower stem; gonotheca with two upward-facing hydrothecae each with a fully formed hydranth at about two thirds distance up body of gonotheca. One gonotheca containing a row of sausage-shaped gonophores around the periphery containing ova and one mature gonophore containing a single spherical ovum. Gonothecal aperture obscured.

Perisarc of lower stems and branches moderately thick, thinning on distal internodes; perisarc of gonotheca fairly thick, smooth. Colonies white (preserved material).

Measurements (μm)

Stem		
length of internode	435	553
width at node	70	98
Hydrotheca		
diameter at margin	129	144
diameter at diaphragm	109	125
depth, diaphragm to margin	55	59
Gonotheca		
height including pedicel	901	1078
diameter	588	666

Remarks

A small infertile colony reported by Watson (1997) as *Halecium nanum* Alder, 1859 from the Abrolhos Islands, Western Australia, is identical in morphology and critical dimensions with the present specimen, the only difference being fewer secondary branches in the Abrolhos specimen. As the gonotheca of the present specimen is quite different from that of *H. nanum*, neither the Abrolhos material nor the present specimen can be that species. Unfortunately, one of the two gonothecae present in the sample is immature and the apertural neck of the other is damaged. While probably an undescribed species, accurate diagnosis must await the finding of further undamaged fertile material.

Sertulariidae Lamouroux, 1812

Stereotheca elongata (Lamouroux, 1816)

Sertularia elongata Lamouroux, 1816: 189, pl. 5, Bale, 1884: 75, pl. 6, figs 7, 8, pl. 19, fig. 7, - Bale, 1915: 277, Hodgson, 1950: 23, figs 38, 39.

Stereotheca elongata - Stechow, 1923: 203, - Bale, 1924: 252, - Stechow, 1925: 231, - Trebilcock, 1928: 23, - Blackburn, 1937: 368, - Blackburn, 1938: 320 - Blackburn, 1942: 112, - Ralph, 1961: 763, fig. 4e-k, - Ralph, 1961: 109, - Rees & Thursfield, 1965: 144, - Ralph, 1966: 159, - Shepherd & Watson, 1970: 140, - Millard, 1975: 313, fig. 101D, E, - Watson, 1975:

166, - Watson, 1982: 96, fig. 4.8i, pl. 9.1, - Staples & Watson, 1987: 218, - Watson, 1992: 220, - Watson, 1994: 67, - Watson, 1996: 78.

Specimens examined

SAM H1338 depths 18 m and 27 m (dredge), coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Stereotheca elongata was also noted at shallower depths epiphytic on a variety of substrates, namely the ascidian *Herdmania momus*, algae and seagrass stems. In shallower water habitats the stems of the hydroid are quite short, honey brown in colour and lack the investment of red coralline alga often associated with this species. A single large colony with stems 200 mm long was recovered from the dredgings. The stems of this colony were grey-brown in colour and infested by a white bryozoan. *S. elongata* is a strong, wiry species able to withstand considerable water movement.

Distribution

Southern Australia, New Zealand, South Africa.

Thyroscyphus macrocytharus (Lamouroux, 1824)

Clytia macrocytharus Lamouroux, 1824: 647, - Lamarek, 1837: 199.

Campularia marginata Bale, 1884: 54, - Bale, 1888: 758, - Bartlett, 1907: 62.

Laomedea marginata, - Von Lendenfeld, 1885: 404.

Thyroscyphus marginatus, - Bale, 1914: 91, - Bale, 1915: 245, 258, - Stechow, 1924: 69, - Stechow, 1925: 217, - Blackburn, 1942: 112, - Watson, 1973: 169.

Thyroscyphus halei Calder, 1983: 16, - Watson, 1992: 220.

Thyroscyphus macrocytharus - Watson, 1994: 156, - Watson, 1996: 78, - Watson, 1997: 517, Watson 2000: 37, fig. 29A

Specimen examined

SAM H1339, depth 27 m (dredge), coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A small infertile colony on the ascidian *Herdmania momus*.

Distribution

Southern and tropical Australia.

Parascyphus simplex (Lamouroux, 1816)

Laomedea simplex Lamouroux, 1816: 207.

Thyroscyphus simplex - Briggs, 1914: 286, 288, - Bale, 1915: 245, - Bale, 1924: 236, - Trebilcock, 1928: 8, - Blackburn, 1937: 364, - Hodgson, 1950: 10, fig. 22.

Campanularia tridentata - Bartlett, 1907: 42.
Parascyphus simplex - Ritchie, 1911: 160, fig. 1. - Stechow, 1925: 224. - Totton, 1930: 179, fig. 29a-b. - Blackburn, 1938: 321. - Blackburn, 1942: 112. - Ralph, 1961: 755, fig. 1b. - Rees & Thursfield, 1965: 117. - Millard, 1966: 491. - Watson, 1973: 169. - Millard, 1975: 270, fig. 89A-B. - Stepanjants, 1979: 60, pl. 10, fig. 4. - Blanco, 1994: 198. - Watson, 1994: 67. - Watson, 1996: 78.

Specimens examined.

SAM H1340, (depth 27 m, 37 m (dredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Many small colonies on coralline algae and *Sargassum* thalli; some colonies fertile. Gonothecae large, ovoid, borne on a short pedicel on lower stem, some with acrocysts containing three large yellow ova.

Distribution

Southern Australia, New Zealand, South Atlantic, South Africa.

Dynamena quadridentata (Ellis & Solander, 1786)

Sertularia quadridentata Ellis & Solander, 1786: 57, pl. 5 figs. g, G. - Lamarek, 1816: 121. *Dynamena quadridentata* - Billard, 1925: 194, 222, fig. 42. - Trebilecock, 1928: 23. - Blackburn, 1938: 320. - Blackburn, 1942: 113. - Vervoort, 1946: 308. - Pennycook, 1959: 193. - Ralph, 1961: 790, fig. 13c. - Mammen, 1965: 49, fig. 83. - Ralph, 1966: 159. - Vervoort, 1968: 41, 103, fig. 19. - Hirohito, 1969: 20, fig. 14. - Shepherd & Watson, 1970: 140. - Millard & Bouillon, 1974: 8. - Millard, 1975: 266, fig. 87G-J. - Calder, 1983: 11, fig. 3. - Hirohito, 1983: 40. - Calder, 1991: 96, fig. 51. - Calder, 1993: 68. - Vervoort, 1993: 108. - Calder, 1995: 543. - Hirohito, 1995: 176, fig. 57a-c. - Migotto, 1996: 64, 122, fig. 12f-g. - Watson, 1996: 78. - Watson, 1997: 520, fig. 5C. - Watson, 2000: 15, fig. 10C-E. - Watson, 2002: 341, fig. 2C-F.

Dynamena (Pasya) quadridentata - Stechow, 1925: 223.

Pasya quadridentata - Stechow, 1922: 148. - Stechow, 1923: 166. - Fraser, 1948: 239.

Pasythea (Sertularia) quadridentata - Lamouroux, 1812: 183.

Pasythea quadridentata - Lamouroux, 1816: 156, pl. 3 fig. 8a, B. - Whitelegge, 1889: 193. - Nutting, 1927: 226. - Gravier-Bonnet, 1999: 83.

Dynamena gibbosa Billard, 1924: 650, fig. 2G.

Pasythea dubia Hargitt, 1927: 511, pl. 1 fig. 5.

Dynamena dubia - Yamada, 1959: 58.

Dynamena thaukasseriensis Mammen, 1965: 48, fig. 82.

Specimen examined

SAM H1341, depth 37 m (dredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Infertile colony on flexuous bryozoan and small brown alga.

Distribution

Circumglobal in tropical and warm temperate waters. Tropical to temperate Australia.

Symplectoscyphus subdichotomus
(Kirchenpauer, 1884)

Sertularella subdichotoma Kirchenpauer, 1884: 46, pl. 16, figs 1, 1a, 1b. - Jäderholm, 1920: 6. - Jäderholm, 1926: 6. - Totton, 1930: 188. - Vervoort, 1946: 314, fig. 5.

Symplectoscyphus subdichotomus. - Stechow, 1922: 149. - Stechow, 1923: 173. - Ralph, 1961: 843, fig. 20a-b. - Ralph, 1966: 159. - Vervoort, 1972: 140, figs. 44b-d, 45. - Watson, 1973: 175. - Millard, 1977: 37, fig. 11D-F. - Watson, 1982: 99, fig. 4.9i, j, pl. 11.2. - Hirohito, 1983: 53, fig. 25. - Staples & Watson, 1987: 218. - Vervoort, 1993: 241. - Blanco, 1994: 205. - Watson, 1994: 67. - Hirohito, 1995: 222. - Watson, 1996: 78. - Peña Cantero & García Cárascosa, 1999: 212.

Sertularella divaricata var. *subdichotoma*. - Jäderholm, 1917: 9.

Specimens examined

SAM H1342, depth 21 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Small infertile colonies on vertical surfaces and on thallus of coarse-textured red alga. Stems to 20 mm high, monosiphonic, branched, but without true main stem; anastomoses issuing from apertures of hydrothecae on branches.

While the present specimen is referred to *Symplectoscyphus subdichotomus*, the taxonomic status of the various species comprising the *Symplectoscyphus johnstoni* - *Symplectoscyphus divaricatus* group in southern Australia is in need of critical review.

Distribution

Known with certainty from southern Australia and New Zealand. Other records doubtful.

Symplectoscyphus epizoicus Watson, 1973.

Symplectoscyphus epizoicus Watson, 1973: 177, figs 31-33. - Stranks, 1993: 15. - Vervoort, 1993: 239. - Watson, 1994: 67.

Specimen examined

SAM 111343, depth 9 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Two small infertile stems on hydrocladate part of stem of *Gymnangium* in cavern. The species is an obligate epizooite of aglaopheniid hydroids.

Distribution

Southern Australia.

Sertularella avrilla Watson, 1973

Sertularella avrilla Watson, 1973: 172, figs. 24, 25.- Vervoort, 1993: 189.- Stranks, 1993: 15.- Watson, 1996: 78.

Specimen examined

SAM 111344, depth 9 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A very small infertile colony on stipe of the brown alga *Sargassum*. The outwardly bent distal end of the hydrotheca is characteristic of the species.

Distribution

Southern Australia.

Sertularella pinnata (Lamouroux, 1816)

Caberea pinnata Lamouroux, 1816: 130.- Lamouroux, 1824: 56.

Thuraria lata Bale, 1882: 26, pl. 13, fig. 2.- Bale, 1884: 120, pl. 7, fig. 4.

Sertularella lata - Bale, 1915: 287.- 1919: 337, pl. 16, fig. 5.- Blackburn, 1942: 115.

Sertularella pinnata - Gordon *et al.*, 1998: 413, fig. 6.

Specimen examined

SAM 111371, depth 11 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A fertile epilithic colony in a sheltered cavern. Colony comprising several heavily fascicled, pinnately branched stems to 120 mm high, growing from a common base. This deep water species often attains large size; the present record from shallow water is probably due to the sheltered habitat. *S. pinnata* is recognisable by its orange colour, large recumbent barrel-shaped gonothecae and rather brittle, easily shed hydrocladia. The species was originally described as a bryozoan *Caberea pinnata* from apparently dried material by Lamouroux

(1816); its identity as a hydroid was established by rediscovery of the lost type by Gordon *et al.* (1998).

Distribution

Southern Australia.

Sertularella robusta Coughtrey, 1876

Sertularella robusta Coughtrey, 1876b: 300.- Stechow, 1913: 14.- Bale, 1924: 240.- Jäderholm, 1926: 4, fig. 3.- Trebilcock, 1928: 16, pl. 6, figs 3-3c.- Totton, 1930: 105.- Blackburn, 1937: 171, fig. 1.- Blackburn, 1938: 320.- Blackburn, 1942: 115.- Hodgson, 1950: 33, fig. 58.- Pennycook, 1959: 195, pl. 6, fig. 3.- Ralph, 1961: 824, fig. 22a-d.- Ralph, 1961: 109.- Ralph, 1961: 236.- Ralph, 1966: 159.- Shepherd & Watson, 1970: 140.- Vervoort, 1972: 129, figs 40, 41a.- Watson, 1973: 171, fig. 21.- Watson, 1975: 166, figs 23-24.- Vervoort & Vasseur, 1977: 40, figs 18-22.- Watson, 1982: 100, fig. 4.10d, pl. 11.4. - Hirohito, 1983: 46, fig. 19. - Park, 1992: 292.- Vervoort, 1993: 192.- Watson, 1994: 67.- Hirohito, 1995: 200, fig. 65c, f.- Watson, 1996: 78.- Watson & Melnes, 1999: 111.

Sertularella robusta var. *quasiplana* Trebilcock, 1928: 18, pl. 6, figs 4, 4a.

Sertularella microgona Von Lendenfeld, 1885: 416, pl. 7, figs 1-3.

Sertularella angulosa Bale, 1894: 102, pl. 4, fig. 6.- Stranks, 1993: 6: 14.

Specimens examined

SAM 111345 depth, 16 - 27 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Small colonies usually consisting of a few short, infertile stems on the ascidian *Heidmania nomus*, bryozoans and thalli of *Sargassum*.

Distribution

New Zealand, South Pacific, New Zealand, Japan. Very common in southern Australia.

Amphisbetia minima (Thompson, 1879)

Sertularia minima - Thompson, 1879: 104, pl. 17, fig. 3 - Whitelegge, 1889: 41.- Bartlett, 1907: 42. - Ritchie, 1911: 845. - Bale, 1915: 269.- Briggs, 1918: 34, 37.- Bale, 1924: 248.- Trebilcock, 1928: 23, pl. 7, figs. 5, 5a. - Leloup, 1932: 160. - Blackburn, 1938: 319.- Blackburn, 1942: 114.- Hodgson, 1950: 23, figs. 41-42.- Pennycook, 1959: 197.

Amphisbetia minima - Stechow, 1925: 230, fig. K.- Millard, 1958: 183.- Ralph, 1961: 774, fig. 8a-h.- Ralph, 1961: 236.- Ralph, 1966: 159.- Shepherd & Watson, 1970: 140.- Watson, 1973: 179.- Millard &

Bouillon, 1974: 7.- Millard, 1975: 250, fig. 82H-K.- Watson, 1982: 98, fig. 4.9a, b, pl. 9.3.- Staples & Watson, 1987: 218.- Harris, 1990: 229, fig. 11.4b-d.- Watson, 1994: 67.- Watson, 1996: 78.- Watson & Melnes, 1999: 111.

Nemella minima Stechow, 1921: 259.- Stechow, 1923: 202.

Specimens examined

SAM H1346, depths 21 m and 37 m (tredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Infertile colonies on thalli of *Sargassum* from shallow water and from dredged sample.

Distribution

Very common in southern Australia. Circumglobal in temperate waters.

Amphisbetia maplestonei (Bale, 1884)

Sertularia maplestonei Bale, 1884: 70, pl. 6, fig. 4, pl. 19, fig. 2.- Bartlett, 1907: 42.- Bale, 1914a: 16.- Bale, 1915: 276.- Jäderholm, 1917: 17, pl. 2, figs 4-5.- Blackburn, 1942: 113.- Hodgson, 1950: 28, fig. 49.

Amphisbetia maplestonei - Stechow, 1921: 258.- Stechow, 1923: 199.- Shepherd & Watson, 1970: 140.- Watson, 1973: 178.- Millard, 1975: 249, fig. 82A-E.

Specimens examined

SAM H1348, depth 9-27 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Fertile colonies on sponges on vertical walls in cavern, on thalli of coarse red alga and on drifted dead stems of the seagrass *Amphibolis antarctica*. Stems pinnate, to 125 mm high, reddish in colour.

Distribution

Southern Australia: South Atlantic, South Africa, Madagascar.

Amphisbetia olseni Watson, 1973

Amphisbetia olseni Watson, 1973: 179, figs 34-37.- Watson, 1979: 234.- Stranks, 1993: 17.- Watson, 1996: 78.

Specimen examined

SAM H1347, depth 18 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Colony on tough-textured sponge on vertical surface and on the ascidian *Herdmania momus*.

Stems to 5 mm high, sparsely branched; one stem fertile.

Distribution

Southern Australia.

Syntheciidae Marktanner-Furneretscher, 1890 *Hincksella cylindrica* (Bale, 1888)

Sertularella cylindrica Bale, 1888: 765, pl. 16, fig. 7.- Ritchie, 1911: 847.- Stechow, 1923: 150.- Fraser, 1944: 234, pl. 48, fig. 216.

Hincksella cylindrica - Blackburn, 1937: 173, fig. 2.- Pennycook, 1959: 198.- Vervoort, 1959: 245, figs. 18, 19a.- Vervoort, 1968: 101.- Millard, 1975: 232.- Millard, 1978: 194.- Watson, 1979: 234.- Calder, 1993: 68.- Vervoort, 1993: 193.- Watson & Melnes, 1999: 108, fig. 4C.

Specimen examined

SAM H1349, depth 9 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Several sparse, small infertile stems on stem of aglaophemid hydroid.

Distribution

Subtropical and temperate Australian east and southern coasts. Indonesia, Japan, Caribbean Sea, South Africa.

Kirchenpaueriidae Millard, 1962

Pycnotheca Stechow, 1919

Pycnotheca producta (Bale, 1882)

Phymularia producta Bale, 1882: 39, pl. 15, fig. 3.- Bale, 1884: 133, pl. 10, fig. 4.- Stranks, 1993: 13.

Azygoploa producta - Whitelegge, 1889: 193.

Pycnotheca producta - Stechow, 1919: 111.- Pennycook, 1959: 156.- Shepherd & Watson, 1970: 140.- Watson, 1973: 182.- Watson, 1992: 220.- Watson, 1994: 67.- Watson, 1996: 79.- Watson, 1997: 527.

Specimen examined

SAM H 1376, depth 16 m, SAM H1377, depth 20 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A large female colony (SAM H1376) on leaves of the seagrass *Posidonia angustifolia*. Stems to 8 mm high, given off regularly from a broad, flattened hydrorhiza. Median inferior nematoliteca monothalamic with small, upturned terminal rostrum. Gonothecae large, one or two at base of

stem, underside adherent to substrate, gonophore containing many ova. Colour of colony honey brown; may be due to chemical changes in preservative.

A sparse infertile colony (SAM H1377) on soft-textured red alga. Stems to 10 mm high, given off irregularly from a tunnel-shaped hydrorhiza. Median inferior nematotheca monothalamic but lacking terminal rostrum.

The presence or absence of the terminal rostrum of the median inferior nematotheca may be a response to environmental conditions or an indicator of incipient speciation. Due to morphological variation over their geographic range and habitat, the taxonomic status of the three nominal species of *Pyrotheca* (*P. mirabilis*, *P. producta*, *P. bisepata*) requires elucidation.

Distribution

Southern Australia.

Plumulariidae L. Aggassiz, 1862

Plumularia filicaulis Kirchenpauer, 1876

Plumularia filicaulis Kirchenpauer, 1876: 47, pl. 5, fig. 6.- Bartlett, 1907: 42.- Mulder & Trebilcock, 1909: 34.- Mulder & Trebilcock, 1916: 80, pl. 10, figs 6a, 6b, pl. 11, figs 3-3a.- Bale, 1919: 341.- Leloup, 1932: 160.- Hodgson, 1950: 42, fig. 72.- Shepherd & Watson, 1970: 140.- Millard & Bouillon, 1974: 9.- Millard, 1975: 390, fig. 12311-L.- Watson, 1975: 170.- Watson, 1982: 107, fig. 4.11i, j.- Rho & Park, 1986: 10, fig. 3a-c, pl. 1, fig. e.- Antsulevich, 1987: 115, fig. 33.- Staples & Watson, 1987: 218.- Park, 1990: 84.- Park, 1992: 295.- Hirohito, 1995: 273, fig. 93a-d.- Watson, 1996: 79.- Watson, 1997: 533.- Gravier-Bonnet, 1999: 80.

Heteroplon filicaule - Stechow, 1923: 232.

Plumularia filicaulis var. *indivisa* - Bartlett, 1907: 42.- Watson, 1992: 22.

Specimen examined

SAM H1354, depth 37 m (dredge), coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A small, infertile colony on thallus of *Sargassum*. Plumose and simple stems given off from hydrorhiza. Colour white.

Distribution

Southern Australia, South Africa, Chile, Madagascar, Japan.

Monothecha Nutting, 1900

Monothecha compressa (Bale, 1882)

Plumularia compressa Bale, 1882: 42, pl. 15, fig. 5.- Bale, 1884: 142, pl. 12, figs 9,10, pl. 29, figs 39, 40.- Whitelegge, 1889: 193.- Bartlett, 1907: 42.- Mulder & Trebilcock, 1916: 77, pl. 10, figs 5, 5a.- Blackburn, 1938: 316.- Blackburn, 1942: 108.- Stranks, 1993: 9.

Monothecha compressa - Stechow, 1921: 230.- Stechow, 1925: 243.- Watson, 1996: 78.

Specimen examined

SAM H1374, depth 17 - 18 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Large female colonies on leaves of the seagrass *Posidonia angustifolia*. Hydrorhiza broad and flat, running parallel to venation of seagrass leaves. Stems to 5 mm high, older stems brown in colour, younger stems white. Gonothecae much larger than hydrothecae, usually borne singly on pedicel near base of stem, held out perpendicular to stem and almost recumbent to substrate; aperture large, facing upwards, plane of aperture parallel to gonothecal axis.

Distribution

Southern Australia. The record from India (Leloup, 1932) is doubtful.

Monothecha australis (Kirchenpauer, 1876)

Plumularia obliqua var. *australis* Kirchenpauer, 1876: 49, pl. 6, fig. 10.

Plumularia australis - Bartlett, 1907: 42.- Mulder & Trebilcock, 1916: 77, pl. 10, figs 1-1b.- Bedot, 1921: 26.- Stechow, 1921: 260.- Blackburn, 1938: 316.- Blackburn, 1942: 108.- Watson, 1973: 189.- Staples & Watson, 1987: 218.- Watson, 1992: 220.

Monotheccella australis - Stechow, 1923: 13.

Specimens examined

SAM H1375, depth 17 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Abundant female colonies on the seagrass *Amphibolis antarctica*. Hydrorhiza broad, strap-like, running up the seagrass leaves; stems to 4 mm high, given off regularly from hydrorhiza. Gonothecae much larger than hydrotheca, borne singly or in pairs near base of stem; pedicel perpendicular to stem with gonotheca almost recumbent to substrate; body elongate, with upward facing orifice on long neck. Colour of stems white.

In infertile material, *Monothecha australis* is difficult to distinguish from *Monothecha compressa*, the only reliable character being the somewhat more

rounded abcauline wall of the hydrotheca in the former species, compared with a more sinuate outline in the latter species. Separating the two is simpler in fertile material; although the gonothecae are of the same general shape and recumbent habit, that of *M. australis* is more slender than that of *M. compressa*.

It is noteworthy that these two very similar species are both seagrass epiphytes, occurring in two closely adjacent habitats. However the possibility that the difference in size of the gonothecae is a sexual difference in a single species is not tenable, as in this instance colonies from both habitats are female. Nevertheless, *M. compressa* and *M. australis* probably represent active sympatric speciation in two closely related habitats.

Distribution

Southern Australia. A record from India (Leloup, 1932) is doubtful.

Monotheca flexuosa (Bale, 1894)

Plumularia flexuosa Bale, 1894: 115, pl. 5, figs 6-10, - Bartlett, 1907: 42, - Mulder & Trebilcock, 1916: 78, - Blackburn, 1938: 315, - Shepherd & Watson, 1970: 140, - Watson, 1973: 187.

Plumularia (Monotheca) flexuosa - Stechow, 1925: 246.

Monotheca flexuosa - Stechow, 1921: 260, - Hirohito, 1974: 37, fig. 17, - Watson, 1996: 78, - Watson, 2000: 48, fig. 37A-B.

Specimens examined

SAM H11350, depth 37 m (dredge), coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

An infertile colony with stems to 3 mm high on the red alga *Mytilodeca carnosa*. The habit of *Monotheca flexuosa* when associated with this alga is unusual as the hydroid stolons penetrate the outer medulla of the alga, giving rise to external stems (Watson 1973).

Distribution

Tropical and temperate Australia; Japan.

Monotheca obliqua (Johnston, 1847)

Plumularia obliqua Johnston, 1847: 106, pl. 28, fig. 1, - Bartlett, 1907: 43, - Läderholm, 1919: 22, pl. 5, fig. 6, - Stechow, 1919: 113, - Blackburn, 1938: 315, - Blackburn, 1942: 108, - Hodgson, 1950: 39, fig. 68, - Pennycuik, 1959: 180, - Watson, 1973: 189, - Millard, 1975: 396, fig. 125A-B, - Watson, 1979: 234, - Boero & Fresi, 1986: 145, - Roa, 1987: 151, - Gilli, Vervoort & Pagès, 1989: 89, fig. 17A, - Park,

1992: 294, - Cornelius, 1995: 142, fig. 33, - Watson & Melnes, 1999: 111.

Monotheca obliqua - Stechow, 1923: 17, - Leloup, 1932: 160, - Yamada, 1959: 78, - Rho & Park, 1986: 99, - Ryland & Gibbons, 1991: 538, fig. 9, - El Beshbeeshy, 1995: 404, - Medel & López-González, 1996: 202, - Watson, 1996: 78, - Watson, 1997: 529.

Specimens examined

SAM H11351, depth 37 m (dredge), coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Abundant infertile colonies on thallus of *Sargassum*. Stems to 5 mm high, arising at regular intervals from a flat, strap-like hydrothiza. Colour, white.

Distribution

Subtropical and temperate Australia; North Atlantic, Pacific, Japan, Mediterranean Sea.

Monotheca spinulosa (Bale, 1882)

Plumularia spinulosa Bale, 1882: 42, pl. 15, fig. 8, - Bale, 1884: 139, pl. 12, figs 11, 12, - Bale, 1888: 783, - Bartlett, 1907: 43, - Briggs, 1918: 34, 43, - Blackburn, 1937: 368, - Blackburn, 1942: 116, - Pennycuik, 1959: 180, - Ralph, 1961: 109, - Millard, 1962: 301, - Millard, 1966: 494, - Watson, 1973: 188, figs 54, 55, - Millard, 1975: 401, fig. 125E-J, - Millard, 1978: 196.

Plumularia (Monotheca) spinulosa - Stechow, 1925: 246, - Stechow, 1921: 260, - Stechow, 1923: 17, - Leloup, 1932: 160, - Watson, 1996: 78, - Watson, 1997: 529, - Watson & Melnes, 1999: 111.

Specimens examined

SAM H11352, depth 18 - 27 m, coll. J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Sparse infertile colony on the ascidian *Herdmannia monus*.

Distribution

Southern Australia; South Africa, South Atlantic, New Zealand, Japan.

Halopterididae Millard, 1962

Antennella campanuliformis (Mulder & Trebilcock, 1909)

Antennella campanuliformis Mulder & Trebilcock, 1909: 31, pl. 1, figs 6, 9, 10, - Mulder & Trebilcock, 1911: 115, - Bedot, 1917: 125, - Watson, 1973: 182, figs 43, 44, - Watson, 1975: 170, -

Schuchert, 1997: 24, fig. 7. - Watson, 1994: 67.-
Watson, 1996: 78.- Ansm Agis *et al.*, 2001: 135, figs
61-62.

Specimen examined

SAM H1366, depth 5 m, coll: J.E. Watson, Feb.
2002, material alcohol preserved.

Remarks

One fertile colony on red alga in cavern. Stems to
2 mm high, male and female gonothecae on same
stem. Colour, yellowish green.

Distribution

Southern Australia; Mediterranean Sea, Spain,
Indian Ocean, Canary Islands.

Antennella secundaria (Gmelin, 1791)

Sertularia secundaria Gmelin, 1791: 3856.

Aglaophenia secundaria. - Lamouroux, 1824: 19

Plumularia secundaria - Blackburn, 1938: 316.

Antennella secundaria. - Pennycook, 1959: 176.

Watson, 1973: 183. Millard, 1975: 332. - Ryland &
Gibbons, 1991: 525. - Ramil & Vervoort, 1992: 143.
- Medel & Vervoort, 1995: 35. - Watson, 1996: 78. -
Schuchert, 1997: 14. - Watson, 1997: 522. - Watson,
2000: 45.

Antennella secundaria. - Stechow & Müller, 1923:
473.

Specimens examined

SAM H1353, depths 9 - 27 m, coll: J.E. Watson,
Feb. 2002, material alcohol preserved.

Remarks

Small colonies, stems to 3 mm high, on
Sargassum, on stem of aglaopheniid hydroid and on
the ascidian *Herdmania momus*.

Distribution

Southern to tropical Australia; cosmopolitan, warm
temperate to tropical seas.

Gattya halei (Bartlett, 1907)

Plumularia halei Bartlett, 1907: 65, fig. 1. - Mulder
& Trebilcock, 1909: 29, pl. 1 figs 1-3. - Stranks,
1993: 8. - Briggs, 1918: 34, 41, pl. 5, figs 8-10. - Bale,
1919: 344, pl. 17, fig. 6. - Blackburn, 1937: 368.

Gattya halei - Watson 1973: 186. - Watson, 1996:
78. - Schuchert, 1997: 145, fig. 50. - Gravier-Bonmet,
1998: 123.

Specimens examined

SAM H1367, depths 10 - 27 m, coll: J.E. Watson,
Feb. 2002, material alcohol preserved.

Remarks

Several small colonies on thalli of brown and red
algae. Stems to 7 mm high, one stem fertile. A rare
species.

Distribution

Southern Australia.

Aglaopheniidae L. Aggassiz, 1862

Aglaophenia carinifera Bale, 1914

Aglaophenia carinifera Bale, 1914a: 181, pl. 38,
figs 1, 2. - Bale, 1915: 318. - Bedot, 1921: 341. -
Blackburn, 1942: 110. - Stranks, 1993: 9.

Specimen examined

SAM H1355, depth 18 m, coll: J.E. Watson, Feb.
2002, material alcohol preserved.

Remarks

A large infertile colony of many stems on vertical
rock face. Stems to 150 mm high, plumose, some
subdichotomously branched near base, fascicled and
ahydrocladate proximally, polysiphonic tubes
becoming fewer up stem; distal stem region
monophonic, hydrocladia long. Colour of colony
golden brown.

Distribution

Great Australian Bight.

Aglaophenia divaricata (Busk, 1852)

Plumularia divaricata Busk, 1852: 398.

Aglaophenia divaricata - Whitelegge, 1889: 194. -
Bale, 1884: 162, pl. 15, fig. 7, pl. 17, fig. 7. - Bartlett,
1907: 43. - Ritchie, 1911: 866. - Bale, 1915: 309. -
Briggs, 1915: 315. - Jäderholm, 1917: 18, pl. 2 fig.
7. - Briggs, 1918: 34, 44. - Nutting, 1927: 232. -
Blackburn, 1937: 368. - Blackburn, 1942: 110. -
Vervoort, 1946: 341. - Hodgson, 1950: 61, fig. 92. -
Ralph, 1966: 159. - Staples & Watson, 1987: 218. -
Watson, 1994: 67.

Aglaophenia divaricata var. *divaricata* - Watson,
1982: 110, fig. 4.13a, b.

Theocarpus divaricatus - Watson, 1973: 194.

Specimen examined

SAM H1357, depths 27 m and 37 m (dredge), coll:
J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

An infertile colony of many stems to 150 mm high
growing from a common base on stipe of *Sargassum*.
Stems lightly fascicled and unbranched proximally,
branching of several orders distally, forming a loose
canopy of pinnate branches. The dark brownish-

black colour is characteristic of the nominal variety *A. macroyi*. The taxonomic status of the three nominal varieties of *Aglaophenia divaricata* (*A. macroyi*, *A. briggsi*, *A. cristifera*) which are distinguishable only on minor microscopic characters are in need of critical review.

Watson (1973) was mistaken in referring her specimens from Pearson I, to *Thecocarpus*. This is the commonest agalopheniid hydroid in southern Australia.

Distribution

Southern Australia and Lord Howe I. A record from the Philippines is doubtful.

Gymnangium ascidioides (Bale, 1882)

Aglaophenia ascidioides Bale, 1882: 20, pl. 13, fig. 5.

Halicornaria ascidioides, Bartlett, 1907: 43.- Jäderholm, 1917: 21, pl. 2, fig. 13.- Briggs, 1918: 34, 43, pl. 6, fig. 3.- Bedot, 1921: 346.- Stechow, 1923: 236.- Shepherd & Watson, 1970: 140.- Watson, 1994: 67.

Specimens examined

SAM H1356, depth 9 m, coll: J.F. Watson, Feb, 2002, material alcohol preserved.

Remarks

One small infertile stem and two fertile stem fragments detached from substrate. Stems pinnate, monosiphonic, to 40 mm high. Gonothecae urn-shaped. Colour deep reddish-brown.

Certain authors (e.g. Stechow 1912) synonymised *G. ascidioides* in *G. arcuatum* (Lamouroux, 1816) but Bale (1913) considered the two species separate. Since the present specimen more resembles Bale's concept of *G. ascidioides*, especially in having two subopposite hydrocladia per internode, the two species are considered separate.

Distribution

Southern Australia

Gymnangium proliferum (Bale, 1882)

Halicornaria prolifera Bale, 1882, 34, pl. 14, fig. 5.- Bale, 1884: 183, pl. 14, fig. 1, pl. 16, fig. 10.- Whitelegge, 1889: 193.- Bartlett, 1907: 43.- Ritchie, 1911: 858, pl. 85, figs 2-3.- Briggs, 1918: 34, 44.- Bedot, 1921: 348.- Watson 1973: 197.

Gymnangium proliferum. - Stechow, 1923: 237.- Watson, 1982: 114, fig. 4.13h - Watson, 1994: 67

Gymnangium (Halicornaria) prolifera. - Stechow, 1921: 233.

Specimens examined

SAM H1358, depths 9 m and 27 m (dredge), coll: J.F. Watson, Feb, 2002 material alcohol preserved.

Remarks

Fertile and infertile colonies epilithic on vertical rock faces and in caverns. Some colonies comprising simple pinnate stems, others sparsely branched in one plane. Stems monosiphonic, single stems to 120 mm high, branched colonies a little shorter. Colour variable from pale honey yellow to brown.

Distribution

Southern Australia.

Gymnangium humile (Bale, 1884)

Halicornaria humilis Bale, 1884: 182, pl. 13, fig. 8, pl. 16, fig. 6. - Jäderholm, 1917: 21, pl. 2, fig. 12.- Bedot, 1921: 348. - Stranks, 1993: 11.

Halicornaria humilis (?) - Bartlett, 1907: 43.

Gymnangium humile - Stechow, 1923: 237.

Gymnangium (Halicornaria) humilis - Stechow, 1921: 233.

Specimens examined

SAM H1372, depth 21 m, coll: J.F. Watson, Feb, 2002, material alcohol preserved.

Remarks

Infertile colony on rock wall comprising a cluster of many stems to 90 mm high. Several stems lightly fuscated near base, polysiphonic tubes running for a short distance up stem. Some stems branched subdichotomously near base, all stems pinnate, hydrocladia rather short. Stems pale brown, hydrocladia fawn.

In microscopical detail *Gymnangium humile* closely resembles *Gymnangium proliferum* (Bale, 1882). It can be distinguished from that species by the smaller lateral nematothecae with more forwardly pointing orifice and the long, rather slender, fawn-coloured hydrocladia. Bale (1884) described a small specimen of *G. humile* approximately 10 mm high, epizoid on several larger species of *Gymnangium*, considering its habit "very similar to the parasite form of *G. longirostris*", *G. longirostris* has two habits - a small epizoid form living on other species of *Gymnangium* and larger, independent colonies (Watson, pers. obs.). If *G. humile* is found to have similar habit, the two species may need to be united.

Distribution

Southern Australia

Gymnangium superbe (Bale, 1882)

Agalophenia superba Bale, 1882: 31, pl. 13, fig. 4.
Halicornaria superba Bale, 1884: 175, pl. 12, fig. 1, pl. 16, fig. 4.- Bartlett, 1907: 43.- Bale, 1913: 145.- Bale, 1915: 324.- Briggs, 1915: 312.- Bedot, 1921: 348.- Hodgson, 1950: 53, fig. 85.
Gymnangium superbum - Stechow, 1923: 237.- Blackburn, 1942: 109.- Watson, 1982: 112, fig. 4.121, pl. 12.5.- Watson, 1994: 67.

Specimens examined

SAM 111359, depth 18 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A colony of many stems arising from a common hydrorhiza on rock wall. Colony infertile, stems gracefully plumose, lax, monosiphonic, unbranched, up to 120 mm high. Hydrocaulus brown, hydrocladia pale yellowish-green. The species is characterised by its graceful habit, pale colour and tendency to exude mucus upon collection (Watson, pers. obs.)

Distribution

Southern Australia

Campanulariidae, Johnston, 1837

Silicnaria undulata (Mulder & Trebilcock, 1914)

Mulder & Trebilcock, 1914: 10, pl. 2, figs 5-7 - Bale, 1914b: 89.- Bale, 1919: 327.- Blackburn, 1938: 324.- Blackburn, 1942: 105.- Ralph, 1956: 293.- Blanco, 1967: 221.- Watson, 1992: 220, 221.- Watson, 1994: 154, fig. 3A-F.- Watson, 1996: 78.

Specimens examined

SAM 111370, depth 17 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Infertile colonies on leaves of the seagrass *Amphibolis antarctica*. *S. undulata* is a common epiphyte of *A. antarctica*.

Distribution

Southern Australia.

Orthopyxis caliculata (Hincks, 1853)

Campanularia caliculata Hincks, 1853: 178, pl. 5, fig. 5.- Hincks, 1868: 164, pl. 31, fig. 2.- Whitelegge, 1889: 195.- Picard, 1952: 346.

Orthopyxis caliculata - Bale, 1914b: 74, pl. 11, fig. 1, pl. 12, fig. 1 - Stechow, 1923: 7.- Bale, 1924: 232.- Bale, 1934: 273.- Hodgson, 1950: 7, figs 14-16.- Ralph, 1957: 838, fig. 6a-f.- Pennycook, 1959: 172.- Riedl, 1959: 633.- Yamada, 1965: 361.- Ralph, 1966: 158.- Blanco, 1967: 262.- Shepherd & Watson, 1970,

94: 140.- Watson, 1975: 158.- Watson, 1994: 67.- Watson & McInnes, 1999: 111.

Campanulina caliculata var. *macrogonia* Von Lendenfeld, 1885: 922.

Orthopyxis macrogonia Bale, 1914b: 77, pls 11, 12, fig. 2.

Encopella caliculata - Fraser, 1911: 36.- Fraser, 1944: 146, pl. 26 fig. 119.- Hirohito, 1969: 6, fig. 6.

Campanularia caliculata var. *macrogonia* - Bartlett, 1907: 42.- Hilgendorf, 1911: 540.

Specimens examined

SAM 111360, depth 27 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A richly fertile colony on thallus of *Sargassum* growing on a rock face. Hydrorhiza reptant on algal frond; stolons and hydrothecae pedicels smooth. Gonothecae recumbent to substrate; gonophores eumedusoid in structure

Distribution

Southern Australia, New Zealand.

Orthopyxis crenata (Hartlaub, 1901)

Encopella crenata Hartlaub, 1901: 364, pl. 22, figs 27-31, 33-35.- Hirohito, 1969: 7, fig. 7.

Orthopyxis crenata - Bale, 1924: 232, fig. 3.- Stechow, 1925: 210.- Trebilcock, 1928: 3.- Bale, 1934: 273.- Picard, 1958: 191.- Pennycook, 1959: 172.- Ralph, 1961: 189.- Leloup, 1974: 17, fig. 15.- Cornelius, 1982: 58, fig. 5.- Gili *et al.*, 1989: 23.- Cornelius, 1992: 257.- Boero & Bouillon, 1993: 265.- Peña Cantero, 1995: 479, pl. 61, fig. e.- Medel & López-González, 1996: 207.- Mijotto, 1996: 123.- Watson, 1996: 78.- Ramil & Ansin Agis, 1998: 201.- Medel & Vervoort, 2000: 58, fig. 13a.

Orthopyxis crenata f. *crenata* - Ralph, 1957: 838, fig. 65g-v.

Campanularia crenata - Picard, 1951: 261.- Millard & Bouillon, 1973: 47, fig. 613-f.- Millard, 1975: 204, fig. 68A-f.- Boero, 1981: 182.- Hirohito, 1995: 53, fig. e-k.

Specimen examined

SAM 111361, depth 27 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A sparingly fertile colony with immature gonothecae on thallus of red coralline alga on rock wall. Stolons tubular, hydrothecae large and squarish in shape with weakly crenulate margin; pedicels completely corrugated.

The names *Orthopyxis* (for campanulariid

hydroids with a compressed hydrotheca) and *Campanularia* (those with radially symmetrical hydrotheca) are often loosely applied to these genera, leading to much systematic confusion. Schuchert (2001) rightly pointed out that *Campanularia crenata* Allman, 1876 with a campanulate hydrotheca is a different species from *Orthopyxis crenata* (Harlaub, 1901).

Distribution

Cosmopolitan.

Campanularia guassica Stechow, 1923

Campanularia guassica Stechow, 1923: 102, fig. K.- Leloup, 1960: 232, fig. 5.- Watson, 1973: 162, fig. 3.- Watson, 1994: 67.

Specimen examined

SAM H1362, depth 9 m, coll: J.L. Watson, Feb. 2002, material alcohol preserved.

Remarks

A sparingly fertile colony of several stems on the ascidian *Herdmania momus*. Hydrothecal pedicels to 4 mm high.

Distribution

Southern Australia, Antarctica and Kerguelen I.

Campanularia mytsensis sp. nov.

Fig. 2A-E

Campanularia groenlandica Levinsen, 1893 - Hirohito, 1995: 54, fig. 16a-b.

Specimens examined

SAM H1368, holotype, fertile colony on lower stem of *Gymnangium* sp., depth 27 m (dredge), coll: J.L. Watson, Feb. 2002, material alcohol preserved. MVT², paratype, fertile colony on test of the ascidian *Herdmania momus*, depth 18 m, coll: J.L. Watson, Feb. 2002, all material alcohol preserved.

Description (of holotype and paratype)

Colonies stolonal, stolons tubular, reticulating, giving off hydrothecae and gonothecae at irregular intervals. Hydrothecal pedicels long, cylindrical, slender, of same diameter as hydrothizal stolons, perisarc smooth; base of pedicel with several indistinct annulations, pedicels thereafter mostly smooth but some faintly annulated in distal region; some with regeneration nodes. Pedicel ending in a flattened shoulder supporting a bun-shaped spherule below hydrotheca. Hydrotheca radially symmetrical, narrowly campanulate, with a narrow basal chamber and diaphragm marked by a distinct annular

thickening of wall; hydrotheca thereafter widening gradually to margin. Margin with 8 - 12 rounded cusps, embayments between deep, of same size and shape as cusps. Hydranth with 16 - 20 tentacles. Gonothecae arising singly from hydrothiza on a short, stout, deeply corrugated pedicel of up to four segments. Gonotheca ovoid when young, widening distally near maturity, body smooth, distal end a low opercular dome, aperture circular, small, sometimes slightly displaced to one side; a small submarginal collar of perisarc. Gonophore large, occupying much of gonotheca; no internal structures visible but sex probably male. Perisarc moderately thick throughout, thinning a little towards hydrothecal margin. Hydrocaulus and gonotheca colourless, hydrothiza, hydranths and gonophores white.

Measurements (μm)

Hydrotheca	
Length of pedicel	1,862 - 4,110
Diameter of pedicel	70 - 90
Diameter of spherule	86 - 98
Diameter at diaphragm	133 - 140
Depth, diaphragm to margin	687 - 751
Diameter at rim	411 - 506
Height of marginal cusps	59 - 70
Distance between cusps	47 - 51
Gonotheca	
Length of pedicel	134 - 174
Diameter of pedicel	70 - 78
Maximum length excluding pedicel	627 - 784
Maximum diameter	353 - 372
Diameter of aperture	142 - 150

Remarks

The abundant gonothecae contain large, probably male gonophores. The hydrothecae are deeply campanulate with a variable number of marginal cusps. Hydrothecae slightly flattened during mounting give a false impression of width.

In many respects *Campanularia mytsensis* matches *Campanularia mollis* Stechow, 1919 but differs from that species in its smoother pedicel, larger hydrothecae with longer marginal cusps and larger gonothecae. Schuchert (2001) doubted *Campanularia groenlandica* Levinsen, 1893 from Japan (see Hirohito 1995) is that species. Hirohito's figure and dimensions (extracted from his figure) shows that his material is *Campanularia mytsensis*.

Clytia hemisphaerica (Linnaeus, 1767)

Medusa hemisphaerica Linnaeus, 1767: 1098.

Clytia hemisphaerica - Millard, 1966: 478, fig. 14A-F.- Millard & Bouillon, 1974: 5.- Millard, 1975: 217, fig. 72A-D.- Cornelius, 1982: 73, fig. 9.- Watson, 1982: 93, fig. 4.7k.- Cornelius, 1987: 34, pl. 1, fig. b.- Hughes, 1987: 178.- Vervoort, 1987: 96.- Gibbons & Ryland, 1989: 402, figs 19-21.- Gili, Vervoort & Pagès, 1989: 106, fig. 30 B. C.- Calder,

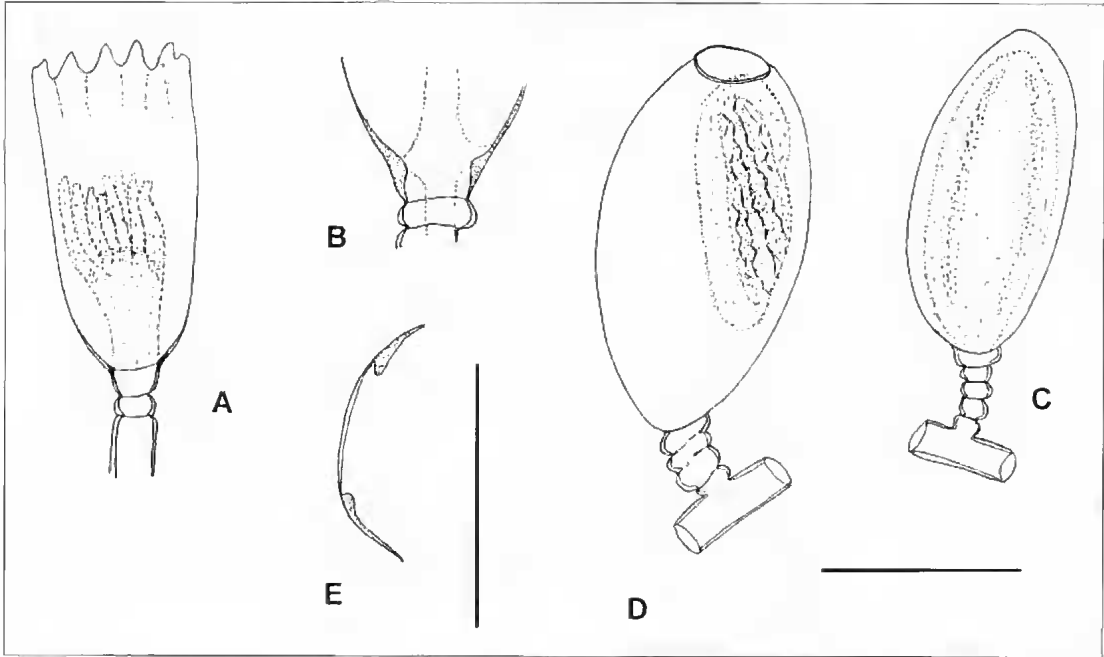


Fig. 2. A-E. *Campanularia myrsensis* sp. nov. A, hydrotheca. B, base of hydrotheca with pedicel and basal chamber. C, immature gonotheca. D, mature gonotheca with gonophore. E, apex of mature gonotheca with operculum and submarginal collar. Scale bar: A, D, C, 0.5 mm; B, E, 0.3 mm.

1991: 2068.- Cornelius, 1992: 254, 257.- Pagès, Gili & Bouillon, 1992.- Watson, 1992: 220.- Calder, 1993: 67.- Boero & Bouillon, 1993: 264.- Watson, 1994: 67.- Calder, 1995: 543.- Cornelius, 1995: 252, fig. 57.- El Beshbeeshy, 1995: 314.- Medel & López-González, 1996: 205.- Migotto, 1996: 82, 121, fig. 15 d-f.- Watson, 1996: 78.- Genzano & Zamponi, 1997: 291.- Watson & McInnes, 1999: 111.- Medel & Vervoort, 2000: 34.- Schuchert, 2000: 413.

Clytia ?hemisphaerica - Watson, 1994: 151, fig. 2A-I.

Specimen examined

SAM H1369, depth 16 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

A small fertile colony on bryozoan growing on a small sponge on rock wall.

Distribution

Cosmopolitan. A common southern Australian species.

Obelia ?spinulosa Bale, 1894

Campanularia (?) hispinosa Bale, 1894: 756, pl. 12, figs 5-7.

Obelia spinulosa - Annandale, 1915: 106, fig. 9. - Gravely, 1919: 396. - Billard, 1927: 333, fig. 2. - Leloup, 1932: 155, pl. 17, figs 6, 6a, text figs 24, 25. - Picard, 1950: 192.

Laomedea spinulosa Leloup, 1933: 11, 22.

Laomedea (Obelia) spinulosa. - Rees & Thursfield, 1965: 93.

Specimens examined

SAM H1363, depth 10–20 m, coll: J.E. Watson, Feb. 2002, material alcohol preserved.

Remarks

Abundant fertile colonies infesting a purple soft-textured digitate sponges among boulders. Colonies fragile, collapsing out of fluid. Hydrothiza tubular, loosely adherent to surface of sponge, perisarc of stolons attached to spicules protruding from the surface of the sponge. Colonies comprising single hydrothecae arising on short pedicels from hydrothiza, interspersed with erect stems to 4 mm high bearing several alternate hydrothecae. Gonothecae top-shaped, arising from hydrothiza or beside hydrothecal pedicels on erect stems: gonophores containing several developing medusae.

In most respects, especially in overall dimensions, the present specimen resembles *O.*

spinulosa but there is no evidence of incipient fasciculation as described by Bale. I therefore doubtfully assign it to that species and accordingly, have inserted a “?” preceding the species name. It is unclear why Bale (1894 p. 756) also inserted a “?” before the specific name of *O. spinulosa*. It should also be noted that the figured specimen of *O. spinulosa* is erroneously named “*bispinosa*” (Bale 1894, pl. 12, figs 5-7).

Distribution

Australia and southern India. Type locality, Port Jackson, New South Wales, Pacific and Indian Oceans.

Notes on Ecology

Exposure to wave action, the very dense algal forest extending from low water mark to a depth of 25 m and grazing activities of fish have presumably all contributed to the relatively sparse, predominantly cryptic hydroid assemblage.

Hydroid species and their substrates are listed in Table 1. Several small red algae are the preferred substrate for most species (13 occurrences) and the holdfasts, stipes and thalli of the brown kelp *Sargassum* provided substrate for others (11 occurrences). The solitary ascidian *Herdmania*

TABLE 1. *Hydroid species and their substrates, St Francis Island, South Australia.*

Species	<i>H. monus</i>	Sponge	Other	Hydroid	<i>Sargassum</i>	Alga	Seagrass	Epiphytic
<i>Ralpharia magnifica</i>			1					
<i>Endendrium ?currumbense</i>	1	•						
<i>Solanderia fusca</i>								1
<i>Filellum antarcticum</i>				+				
<i>Hydrodendron armatum</i>					+			
<i>Hydrodendron australe</i>	1	1						
<i>Hydrodendron daidatum</i>						+		
<i>Halecium delicatulum</i>	1	+		1	+	+		
<i>Halecium sp.</i>						+		
<i>Stercotheca elongata</i>	+						+	
<i>Phyrosocyphus macrocytharus</i>	+							
<i>Parascyphus simplex</i>					+	+		
<i>Dynamena quadridemata</i>			+			1		
<i>Symplectoscyphus subdichotomus</i>						+		
<i>Symplectoscyphus epizoicus</i>				+				
<i>Sertularella avrilia</i>					+			
<i>Sertularella pinnata</i>					+			
<i>Sertularella robusta</i>	+		1		+			
<i>Amphisbeta minima</i>					1			
<i>Amphisbeta maffestonci</i>		1				1	+	
<i>Amphisbeta olseni</i>	+	1						
<i>Thiacksella cylindrica</i>				+				
<i>Pycnotheca producta</i>						1	+	
<i>Plumularia filicaulis</i>					+			
<i>Monotheca australis</i>							1	
<i>Monotheca compressa</i>							+	
<i>Monotheca flexuosa</i>						•		
<i>Monotheca obliqua</i>					+			
<i>Monotheca spinulosa</i>	1							
<i>Antennella campanuliformis</i>					1			
<i>Antennella secundaria</i>	+				1			
<i>Gattya halei</i>						1		
<i>Aglaophenia carinifera</i>								+
<i>Aglaophenia divaricata</i>					+			
<i>Gymnangium ascidioides</i>			+					
<i>Gymnangium proliferum</i>								
<i>Gymnangium humile</i>								
<i>Gymnangium superbe</i>								
<i>Siphularia unclulata</i>							1	
<i>Orthopyxis caliculata</i>								
<i>Orthopyxis crenata</i>						1		
<i>Campanularia gaussonia</i>								
<i>Campanularia unytsensis</i> sp. nov.				+				
<i>Clytia hemisphaerica</i>								
<i>Obelia ?spinulosa</i>								
Total Records	11	6	4	5	11	13	6	6

nomus was the most favoured invertebrate substrate, its large leathery test providing habitat for many smaller hydroid species (11 occurrences). Leaves of the seagrasses *Posidonia angustifolia* and *Amphibolis antarctica* were colonised by a suite of small plumulariids (*Pyrothoea producta*, *Monotheea australis*, *Monotheea compressa*), and one campanulariid, *Silicnularia unchilata*. Larger aglaopheniid species were predominantly epilithic, usually growing in clusters of several to many stems in sheltered caverns and on rock walls. An exception was *Aglaophenia divaricata* recovered from the holdfast of *Sargassum* in deeper water. As hydroids often favour sponges as substrate it was surprising that there were so few records (6 occurrences). This lack of sponge-epizoid relationship may be attributable to the collection being chiefly from a shallow water, algal dominated habitat. The hydroid fauna from deeper reefs below the algal zone, not sampled in this survey, are likely to include the larger species usually from sponge

and other invertebrate substrates. Six small hydroid species were epizootic on larger aglaopheniid hydroids, this being a favoured, and in some cases, obligate association (e.g. *Symplectoseyphus epizoides*).

Twenty one species representing 48% of the shallow water fauna are endemic to Australia, most being restricted in distribution to temperate and cool temperate southern Australia. Thirteen species (30%) have a southern hemisphere distribution and four species (9%) are cosmopolitan.

Acknowledgements

I am grateful to Rob Lewis, head of the South Australian Research and Development Institute for the invitation to participate in the Encounter 2002 Expedition. I also thank my companions on various dives and the Captain and crew of RV *Ngerin* for their unfailingly cheerful assistance during the expedition.

References

- ALLMAN, G. J. (1864) On the construction and limitation of genera among the Hydroïda. *Ann. Mag. nat. Hist.* **43**, 345-380.
- AGASSIZ, A. (1865) North American Acletothoeae. *Illus. Cat. Mus. Comp. Zool. Harvard* **2**, 1-234. (Cambridge).
- ANTSELIVICH, A. E. (1987) Hydroïds of the shelf waters of Kurile Islands. *Zool. Institut. Akad. Nauk SSSR. Leningrad* 1-165. (Russian with English summary)
- BALCH, W. M. (1882) On the Hydroïda of south-eastern Australia, with descriptions of supposed new species, and notes on the genus *Aglaophenia*. *J. Microsc. Soc. Vic.* **2**, 15-48.
- _____ (1884) "Catalogue of the Australian Hydroïd Zoophytes". (Australian Museum, Sydney)
- _____ (1888) On some new and rare Hydroïda in the Australian Museum collections. *Proc. Linn. Soc. N.S.W.* **3**, 745-799.
- _____ (1894) Further notes on Australian hydroïds, with descriptions of some new species. *Proc. R. Soc. Vic.* **6**, 93-117.
- _____ (1913) Further notes on Australian hydroïds. II. *Ibid.* **26**, 114-147.
- _____ (1914a) Report on the Hydroïda collected in the Great Australian Bight and other localities. *Biol. Res. Endeavour: 1909-1914*, **2**, 1-62.
- _____ (1914b) Further notes on Australian hydroïds. III. *Proc. R. Soc. Vic.* **27**, 72-93.
- _____ (1915) Report on the Hydroïda collected in the Great Australian Bight and other localities. *Biol. Res. Endeavour: 1909-1914*, **3**, 241-336.
- _____ (1919) Further notes on Australian hydroïds. IV. *Proc. R. Soc. Vic.* **31**, 327-361.
- _____ (1924) Report on some hydroïds from the New Zealand coast, with notes on New Zealand Hydroïda generally, supplementing Farquhar's list. *Trans. Proc. N.Z. Inst.* **55**, 225-268.
- _____ (1934) Note on *Campanularia integra* and *Orthopsis caliculata*. *Proc. Linn. Soc. N.S.W.* **59**, 273-275.
- BARLETTI, G. C. (1907) Notes on hydroïd zoophytes. *Geelong Nat.* **3**, 35-45.
- BROTH, M. (1921) Notes systematiques sur les plumulariides. Ire partie. *Revue suisse Zool.* **28**, 311-356.
- BILLARD, A. (1925) Les hydroïdes de l'expédition du Siboga. II. Syntheciidae et Sertulariidae. *Res. Explor. Siboga, monog.* **7b**, 117-232.
- BLACKBURN, M. (1937) Reports of the McCoy Society for field investigation and research No.1, Lady Julia Percy Island 1935 expedition. Coelenterata. *Proc. R. Soc. Vic.* **49**, 364-371.
- _____ (1938) Sir Joseph Banks Islands Part 1 Hydrozoa. *Ibid.* **50**, 312-328.
- _____ (1942) A systematic list of the hydroïds of South Australia with a summary of their distribution in other seas. *Trans. R. Soc. S. Aust.* **66**, 104-118.
- BLANCO, O. M. (1967) Contribución al conocimiento de los hidrozoarios Argentinos. *Revta Mus. La Plata Zool.* **9**, 243-297.
- _____ (1994) Claves de familias y generos para facilitar el reconocimiento de los Hydroïda (Leptolina) Athecata, Thecata y Limnomedusae Argentinos (generacion polipoide exclusivamente). *Revta Mus. La Plata Zool.* **160**, 147-179.
- BORRO, F. & BOUILLON, J. (1993) Zoogeography and life-cycle patterns of Mediterranean hydromedusae (Cnidaria). *Biol. J. Linn. Soc.* **48**, 239-266.
- BORRO, F. & PIRAS, E. (1986) Zonation and evolution of a rocky bottom hydroïd community. *Pubbl. Staz. Zool. Napoli.* **7**, 123-150.
- BORRO, F. (1981) Systematics and ecology of the hydroïd population of two *Posidonia oceanica* meadows. *Mar. Ecol.* **2**, 181-197.

- BOUILLON, J., WOUTERS, K. & BOERO, F. (1992) Étude des Sclanderitidae de la Baie de Haïsa (Papouasie Nouvelle-Guinée) avec un révision du genre *Sclanderia* (Cnidaria, Hydrozoa). *Bull. Inst. r. Sci. nat. Belg. Biol.* **62**, 5-33.
- BRADY, J. (1887) Notes on the distribution of *Ceratella fusca* Gray. *Proc. Linn. Soc. N.S.W.* **2**, 575-577.
- BRIGGS, E. A. (1914) Hydrozoa from one hundred fathoms, seven miles east of Cape Pillar, Tasmania. *Rec. Aust. Mus.* **10**, 285-302.
- (1915) Notes on Tasmanian Hydrozoa. *J. Proc. R. Soc. N.S.W.* **48**, 302-318.
- (1918) Descriptions of two new hydroïds, and a revision of the hydroïd-fauna of Lord Howe Island. *Rec. Aust. Mus.* **12**, 27-47.
- (1939) Hydroïda. *Scient. Rep. Australas. antarct. Exped.* **9**, 1-46.
- BROCH, H. (1948) Antarktische Hydroïden. *Res. Norw. antarct. Exped. 1927-1928* **28**, 1-23.
- CAIDLER, D. R. (1983) Hydroïda from estuaries of South Carolina, U.S.A.: families Scutellariidae and Plumulariidae. *Proc. Biol. Soc. Wash.* **96**, 7-28.
- (1991) Associations between hydroïd-species assemblages and substrate types in the mangal of Twin Cays, Belize. *Can. J. Zool.* **69**, 2067-2074.
- (1991) Shallow-water hydroïds of Bermuda: The Thecatae, exclusive of Plumulariidae. *Life Sci. Contr. R. Ontario Mus.* **154**, 1-140.
- (1993) Local distribution and biogeography of the hydroïds (Cnidaria) of Bermuda. *Caribb. J. Sci.* **29**, 61-74.
- (1995) Hydroïd assemblages on holopelagic *Sargassum* from the Sargasso Sea at Bermuda. *Bull. mar. Sci.* **56**, 537-546.
- CORNELIUS, P. F. S. (1982) Hydroïds and medusae of the family Campanulariidae recorded from the eastern North Atlantic, with a world synopsis of genera. *Bull. Br. Mus. nat. Hist., Zool.* **42**, 37-148.
- (1987) Taxonomic characters of the hydramphid thecate hydroïds pp. 29-42. In Bouillon, J., Boero, F., Cierogni, F. & Cornelius, P.F.S. (Eds). "Modern Trends in the Systematics, Ecology and Evolution of Hydroïds and Hydromedusae" (Clarendon Press, Oxford).
- (1992) Medusa loss in leptoid Hydrozoan (Cnidaria), hydroïd rafting, and abbreviated life-cycles among their remote-island faunas: an interim review. In Bouillon, J., Boero, F., Cierogni, F., Gili, J.-M. & Hughes, R. G. (Eds). "Aspects of Hydrozoan Biology". *Scient. mar.* **56**, 245-261.
- (1995) North-West European Thecate Hydroïds and their Medusae. Part I. Introduction, Laothecidae to Haleciidae, pp. 1-347. In Barnes, R. S. K. & Crothers, J. H. (Eds). "Synopses of the British Fauna" (New Series) 50.
- COLEMAN, M. (1876a) Critical notes on the New Zealand Hydroïda, suborder Thecatae. *Ann. Mag. nat. Hist.* **17**, 22-32.
- (1876b) Critical notes on the New Zealand Hydroïda. *Trans. Proc. N.Z. Inst.* **8**, 298-302.
- 1) BUSCHERSTY, M. (1991) Systematische, Morphologische und Zoogeographische Untersuchungen an den Thekaten-Hydroïden des Panarctischen Schelfs. Dissertation, Universität Hamburg, pp. 1-390.
- (1995) Hydroïds of R.V. "Meteor" 5/2 expedition to the southern Red Sea and Gulf of Aden. *Bull. natn. Inst. Oceanogr. Fish., A.R.E.* **21**, 319-365.
- BULL, J. & SOLANDER, D. (1786) "The Natural History of Many Curious and Uncommon Zoophytes, Collected from Various Parts of the Globe". (London: White).
- ERHARDT, C. G. (1834) Beiträge zur physiologischen Kenntnis der Corallenleiere in allgemeinen, und besonders des rathen Meeres, nebst einem Versuche zur physiologischen Systematik derselben. *Abh. K. Akad. Wiss.* **1**, 225-380.
- FRASER, C. M. (1911) The hydroïds of the west coast of North America with special reference to those of the Vancouver Island region. *Bull. Lab. nat. Hist. State Univ. Iowa*, **6**, 3-91.
- (1944) "Hydroïds of the Atlantic Coast of North America" (The University of Toronto Press, Toronto).
- (1948) Hydroïds of the Allan Hancock Pacific Expeditions since March, 1938. *Allan Hancock Pacific Expeditions* **4**, 179-343.
- GENZANO, G. N. & ZAMBONI, M. G. (1992) In "Log. Hydrozoos Bentrónicos de la Costa de Mar del Plata. (Universidad Nacional de Mar del Plata) pp. 1-90.
- (1990) Hidropelipos (Cnidaria) de mar del plata, Argentina. *Neritica* **5**, 35-54.
- GIBBONS, M. J. & RYLAND, J. S. (1989) Intertidal and shallow-water hydroïds from Fiji. I. Alibecata to Scutellariidae. *Mem. Qld Mus.* **27**, 377-432.
- GILI, J.-M., VERVOORT, W. & PAJAS, F. (1989) Hydroïds from the west African coast: Guinea Bissau, Namibia and South Africa. *Scient. mar.* **53**, 67-112.
- GONIAS, J. E. (1791) In "Linne, C. Systema Naturae, ed. 13. Vermes", **1**, 3021-3910, Lipsiae.
- GORDON, D. P., d'Hondt, J.-L., Watson, J. & Spencer-James, D. (1998) Discovery of the lost type species of *Coberea* (Bryozoa) and the identity of *Coberea geminata* Lamourin, 1816 (Hydroïda). *J. nat. Hist.* **32**, 405-418.
- GRAVER-BONNIE, N. (1998) *Gattya wilsoni* spec. nov. (Cnidaria: Hydrozoa), a new hydroïd from Madagascar and an identification key to the *Gattya* species. In den Hartog, J.C., van Bruggen, A.C., Cornelius, P.F.S. & van Olwegen, L.P. (Eds). "Commemorative Volume for the 80th birthday of Willem Vervoort in 1997". *Zool. Verh. Leiden* **323**, 107-124.
- (1999) *Obelia* and other campanulariids (Cnidaria, Hydrozoa) in sargassum beds of Madagascar (Indian Ocean), pp. 77-88. In Stepaniants, S.D. (Ed) "Obelia (Cnidaria, Hydrozoa) Phenomenon. Aspects of Investigations". *Zoosystema Rossica* (suppl. 1).
- GRAY, J. E. (1868) Notes on the Ceratellidae, a family of keratose sponges. *Proc. zool. Soc. Lond.* **1868**, 575-579.
- HAYASHI, C. W. (1927) Some hydroïds of South China. *Bull. Mus. Comp. Zool. Harv.* **67**, 491-520.
- HARRIS, V. A. (1990) "Sessile Animals of the Sea Shore". (Chapman & Hall London).
- HARTMANN, C. (1901) Revision der *Scutellaria*-Arten. *Abh. Geb. Naturh. Hamburg*, **16**, 1-143.
- (1904) Hydroïden, pp. 1-19. In "Résultats du voyage du S.Y. *Belgica* en 1897-1898-1899 sous le commandement de A. Gerlache de Comery, Rapports scientifiques. Zoologie".
- (1905) Die Hydroïden der magalhänischen Region und chilenischen Küste. *Zool. Anz. (Suppl.)* **6**, 497-714.
- HICKSON, S. J. (1903) On the Coelenterata collected by Mr. Crossland in Zanzibar. - I. *Ceratella minima*, n. sp. *Proc. Zool. Soc. Lond.* **1903**, 113-116.
- HILGENDORF, F. W. (1911) On some eulyptoblastic hydroïds from the Kermadec Islands. *Trans. N.Z. Inst.* **43**, 540-543.
- HISLOR, I. (1853) Further notes on British zoophytes, with descriptions of new species. *Ann. Mag. nat. Hist.* **2**, 176-85.
- (1868) "A History of the British Hydroïd Zoophytes". (John Van Voorst, London).
- HIRAHARA, ISAMURO ON JAPAN 1969. Some hydroïds from the Amakusa Islands. *Publ. Biol. Lab. Imp. Household, Tokyo*, **9**, 1-32.
- (1974) Some hydrozoans of the Bonin Islands. *Publ. Biol. Lab. Imp. Household, Tokyo* **11**, 1-55.
- (1983) Hydroïds from Izu Ōshima and Nijijima. *Ibid.* **6**, 1-85.

- (1995) "The Hydroids of Sagami Bay. II". *Publs Biol. Lab. Imp. Household Tokyo* Edited and annotated by M. Yasuda.
- HOBGSON, M. (1950) A revision of the Lasmian Hydroida. *Pap. Proc. R. Soc. Tasn.* 1949, 1-65.
- HUGHES, R. C. (1987) The loss of hydranths of *Laomedea flexuosa* Alder and other hydroids, with reference to hydroid senescence, pp. 171-184. In Bouillon, J., Boero, F., Ciogna, F. & Cornelius, P. F. S. (Eds), "Modern Trends in the Systematics, Ecology and Evolution of Hydroids and Hydromedusae" (Clarendon Press, Oxford).
- HUTTON, E. W. (1904) "Index Faunae Novae Zealandiae". (Dulau & Co., London).
- JÄGERHOLM, B. (1896) Ueber aussereuropäische Hydroiden des zoologischen Museums der Universität Upsala. *Bihang Sv. Vetensk.-Akad. Handl.*, **21**, 1-20.
- _____ (1917) Hydroids from the South Sea. *Redogörelse för Norrköpings Högre Allmänna Läroverk Läsåret, 1916-1917*, 1-25.
- _____ (1919) Zur Kenntnis der Hydroidenfauna Japans. *Arch. Zool.*, **12**, 1-34.
- _____ (1920) On some exotic hydroids in the Swedish Zoological State Museum. *Ibid.*, **13**, 1-11.
- _____ (1926) Ueber einige antarktische und subantarktische Hydroiden. *Ibid.*, **18**, 1-7.
- JOHNSON, G. (1847) "A History of the British Zoophytes". Second edition. Vol. 1, 1-488, vol. 2; pls. 1-74. (Van Voorst, London).
- KIRCHENPAUER, G. H. (1876) Ueber die Hydroidenfamilie Plumulariidae, einzelne Gruppen derselben und ihre Fruchthälter. II. *Plumularia* und *Nemertesia*. *Abh. Ges. Naturwiss. naturwiss. Verein in Hamburg*, **6**, 1-59.
- KRAMP, P. L. (1932) Hydroids, The Godthaab expedition 1928. *Aleddr. Grönland*, **79**, 1-86.
- LAMARCK, de J. B. P. A. (1816) "Histoire Naturelle des Animaux sans Vertèbres", vol. 2, (Paris, Verdrière).
- _____ (1837) "Histoire Naturelle des Animaux sans Vertèbres". 3rd edition. (Bruxelles).
- LAMOUREUX, J. V. E. (1812) Extrait d'un mémoire des polypiers coralligènes non entièrement pierreux. *Nouv. Bull. Soc. philom. Paris*, **5**, 181-188.
- _____ (1816) "Histoire des Polypiers coralligènes flexibles, vulgairement nommés Zoophytes" (Caen, F. Poisson).
- _____ (1824) Polypiers flexibles, pp. 603-695. In Quoy, J. R. C. & Gaimard, J. P. Zoologie "Voyage autour du monde exécuté sur les corvettes de S.M. l'Uranie et la Physicienne, pendant les années 1817, 1818 et 1820, par M. Louis de Freycinet". (Paris, Pillet Aîné).
- LELOUP, E. (1932) Une collection d'hydropolypes appartenant à l'Indian Museum de Calcutta. *Rec. Indian Mus.*, **34**, 131-170.
- _____ (1960) Hydropolypes du Muséum National d'Histoire naturelle de Paris. *Mém. Mus. nat. Hist. nat. Paris*, **17**, 217-241.
- _____ (1974) Hydropolypes calyptoblastiques du Chili. Report no. 48 of the Lund University Clupe Expedition 1948-1949. *Sarsia*, **55**, 1-62.
- LENDENHOFF, R. von (1885) The Australian Hydromedusae. *Proc. Linn. Soc. N.S.W.*, **9**, 206-241, 345-353, 401-420, 467-492, 581-634.
- LEINSEK, G. M. R. (1913) Systematic studies on the Sertulariidae. *Vidensk. Medde. dansk naturh. Foren.*, **64**, 249-373.
- LINNAEUS, C. (1767) "Systema Naturae" (Hydriæ Stockholm, L. Salvii).
- MAAMINS, T. A. (1965) On a collection of hydroids from South India. II. Suborder Thecata (excluding family Plumulariidae). *J. mar. biol. Ass. India*, **7**, 1-57.
- MARSHALL, W. (1892) "Spongiologische Beiträge". (Leipzig, Leuckart).
- MEDEL, M. D. & LOPEZ-GONZALEZ, P. J. (1996) Updated catalogue of hydrozoans of the Iberian Peninsula and Balearic Islands, with remarks on zoogeography and affinities. In S. Piraino, F. Boero, J. Bouillon, P. F. S. Cornelius & Gili, J.-M. (Eds), "Advances in Hydrozoan Biology". *Sci. mar.*, **60**, 183-192.
- _____ & VERVOORT, W. (1995) Plumularian hydroids (Cnidaria: Hydrozoa) from the Strait of Gibraltar and nearby areas. *Zool. Verh. Leiden*, **300**, 11-72.
- _____ & _____ (1998) Atlantic Thyroscyphidae and Sertulariidae (Hydrozoa, Cnidaria) collected during the CANCAP and Mauritania-II expeditions of the National Museum of Natural History, Leiden, The Netherlands. *Zool. Meded. Leiden*, **320**, 1-85.
- _____ & _____ (2000) Atlantic Haleciidae and Campanulariidae (Hydrozoa, Cnidaria) collected during the CANCAP and Mauritania-II expeditions of the National Museum of Natural History, Leiden, The Netherlands. *Ibid.*, **330**, 1-68.
- MICHELLO, A. E. (1996) Benthic shallow-water hydroids (Cnidaria, Hydrozoa) of the coast of São Sebastião, Brazil, including a checklist of Brazilian hydroids. *Zool. Verh. Leiden*, **306**, 1-25.
- MICHAUD, N. A. H. (1958) Hydrozoa from the coasts of Natal and Portuguese East Africa. Part I. Calyptoblastea. *Ann. S. Afr. Mus.*, **44**, 165-226.
- _____ (1962) The Hydrozoa of the south and west coasts of South Africa. Part I. The Plumulariidae. *Ibid.*, **46**, 261-319.
- _____ (1966) The Hydrozoa of the south and west coasts of South Africa. Part III. The Gymnoblastera and small families of the Calyptoblastea. *Ibid.*, **48**, 427-487.
- _____ (1975) Monograph on the Hydroida of southern Africa. *Ibid.*, **68**, 1-513.
- _____ (1977) Hydroids from the Kerguelen and Crozet shelves, collected by the cruise MD-03 of the Marion-Dufresne. *Ibid.*, **73**, 1-47.
- _____ (1978) The geographical distribution of southern African hydroids. *Ibid.*, **74**, 159-200.
- _____ & BOUILLON, J. (1974) A collection of hydroids from Mozambique, East Africa. *Ibid.*, **65**, 1-40.
- MILNER, J. P. & TRIBBLECK, R. L. (1909) Notes on Victorian Hydroida with description of new species. *Göteborg Nat.*, **4**, 1-7, 29-35.
- _____ & _____ (1911) Notes on Victorian Hydroida, with description of new species. *Ibid.*, **4**, 115-124.
- _____ & _____ (1916) Notes on Victorian Hydroida. Part VI. *Ibid.*, **6**, 73-84.
- NALMOV, D. V. & STEPANOVIS, S. D. (1962) Gidroidy podotryada Thecophora, sobrannye v antarkticheskikh i subantarkticheskikh vodakh sovetskoi antarkticheskoi ekspeditsii na dizele "elektrokhode "Ob". *Issled. Fanny Morei*, **1**, 68-106.
- NETTWE, C. (1927) Report on Hydroida collected by the United States Fisheries steamer Albatross in the Philippine region 1910. *Bull. U.S. nat. Mus.*, **100**, 195-242.
- PAGES, F., GILI, J.-M. & BOUILLON, J. (1992) Medusae (Hydrozoa, Scyphozoa, Cubozoa) of the Benguela Current (southeastern Atlantic). In F. Pages, J.-M. Gili & Bouillon, J. (Eds), "Planktonic Cnidarians of the Benguela Current". *Sci. mar.*, **56**, 1-64.
- PARKS, J.-H. (1990) Systematic study on the marine hydroids (Cnidaria: Hydrozoa) in Korea I. *Korean J. Syst. Zool.*, **6**, 71-86.
- _____ (1991) Systematic study on the marine hydroids (Cnidaria: Hydrozoa) in Korea II. The families Sphaerocorynidae, Eudendriidae, Haleciidae and Lafoëidae. *Korean J. Zool.*, **34**, 541-547.

- (1992) Zoogeographical distribution of marine hydroids (Cnidaria: Hydrozoa, Hydroida) in Korea. *Korean J. Syst. Zool.* **8**, 279-299.
- PERA CÁNEFO, A. L. & GARCÍA CARRASCOSA, A. M. (1999) Biogeographical distribution of the benthic thecate hydroids collected during the Spanish "Antarida 8611" expedition and comparison between Antarctic and Magellan benthic hydroid faunas. *Scient. mar.* **63**, 209-218.
- & VERVOORT, W. (1998) On the species of *Tritellum* Hincks, 1868 (Cnidaria: Hydrozoa) with the description of a new species. *J. nat. Hist.* **32**, 297-315.
- PINKYCHUK, P. R. (1959) Faunistic records from Queensland. Part V. Marine and brackish water hydroids. *Pap. Dep. Zool. Univ. Qd.* **1**, 141-210.
- PIRARD, J. (1951) Les hydraires des formations coralligènes des côtes françaises de la Méditerranée. *Ve et Milieu* **2**, 255-261.
- (1952) Note sur les hydraires fillicieux de Banyuls-sur-Mer. *Ibid.* **2**, 338-349.
- (1958) Origines et affinités de la faune d'hydroméduses (Anthoméduuses et Eptoméduuses) de la Méditerranée. *Rapp. P.-v. Reun. Comm. int. Explor. scient. Mer Méditerr.* **14**, 187-199.
- RAITHE, P. M. (1956) Variation in *Obolus ventriculata* (Linnaeus, 1758) and *Silencularia bilabiata* (Coughtry, 1875) (Hydroida, Campanulariidae). *Trans. Roy. Soc. N.Z.* **84**, 279-296.
- (1957) New Zealand thecate hydroids. Part I. Campanulariidae and Campanulimidae. *Ibid.* **84**, 811-854.
- (1958) New Zealand thecate hydroids. Part II. Families Lafoeidae, Fineolariidae, Haleciidae and Syntheciidae. *Ibid.* **85**, 301-356.
- (1961) A checklist of the hydroid fauna of the Chatham Islands. Biological Results of the Chatham Islands 1954 Expedition, part 5. *Mem. N.Z. Ocean. Inst.* **13**, 235-238.
- (1966) Hydroida. Part Phillip Survey 1957-1963. *Mem. univ. Mus. Vic.* **27**, 157-166.
- RAMIL, F., ANSIN ANSIN, J. & FERNÁNDEZ PULPEIRO, J. (1998) Soft-bottom hydroids (Cnidaria: Hydrozoa) collected in the Ria de Vigo (NW Spain). In den Hartog, J. C., van Bruggen, A. C., Cornelius, P. F. S. & van Othwegen, L. P. (Eds), "Commemorative Volume for the 80th birthday of Willem Vervoort in 1997". *Zool. Verh. Leiden* **323**, 181-208.
- & VERVOORT, W. (1992) Report on the Hydroids collected by the "BALGIM" expedition in and around the Strait of Gibraltar. *Ibid.* **277**, 1-262.
- REIBIG, L. (1967) Révision de la collection du Muséum des hydraires de Lamouroux. *Bull. Mus. nat. Hist. nat. Paris* **39**, 381-410.
- ROOS, W. & THURSBELD, S. (1965) The hydroid collections of James Ritchie. *Proc. R. Soc. Edin.* **69**, 34-220.
- & VERVOORT, W. (1987) Hydroids from the John Murray Expedition to the Indian Ocean, with revisory notes on *Hydrodendron*, *Achelinella*, *Cryptolaria* and *Zygophlavus* (Cnidaria: Hydrozoa). *Zool. Verh. Leiden* **237**, 1-209.
- RUO, B. J. & PARK, J. L. (1983) A systematic study on the marine hydroids in Korea. 7. Nine unrecorded species. *J. Korean Res. Inst. Better Living* **31**, 39-50.
- & — (1986) A systematic study on the marine hydroids in Korea. 10. The family Plumulariidae. *Ibid.* **37**, 87-112.
- RUO, R. (1959) Die Hydroiden des Golfes von Neapel und ihr Anteil an der Fauna unterseischen Höhlen. In Ergebnisse der österreichischen Tyrrhenia-Expedition 1952, Teil xvi. *Pubbl. Staz. Zool. Napoli* **30**, 591-755.
- RÜCHMANN, J. (1911) Hydrozoen (hydroid zoophytes and Stylosternata). Scientific results of the rawling expedition of H.M.C.S. "Thetis". *Mem. Aust. Mus.* **4**, 807-869.
- RIBBINSON, A. C., MURRAY-JONES, S. & SHEPHERD, S. A. (2003) Encounter 2002 expedition to the Isles of St Francis, South Australia: Formation of the islands, introductory narrative and marine conservation. *Trans. R. Soc. S. Aust.* **127**, 69-73.
- RÖCK, I. (1987) Hydroids on *Posidonia* in Majorcan waters. pp. 209-214. In J. Bouillon, F. Boero, F. Ciogna & Cornelius, P.F.S. (Eds), "Modern trends in the systematics, ecology and evolution of hydroids and hydromedusae." Oxford, Clarendon Press.
- RYLAND, J. S. & GIBBONS, M. J. (1991) Intertidal and shallow water hydroids from Fiji. 2. Plumulariidae and Aglaopheniidae. *Mem. Qld Mus.* **30**, 525-560.
- SCHUBERT, P. (1997) Review of the family Haloptelididae (Hydrozoa, Cnidaria). *Zool. Meded. Leiden* **309**, 1-162.
- (2000) Hydrozoa (Cnidaria) of Iceland collected by the BIOICL programme. *Sarsia* **85**, 411-438.
- (2001) Hydroids of Greenland and Iceland. *Medde. Grønland, Bioscience* **53**, 1-184.
- SHEPHERD, S. A. & WATSON, J. E. (1970) The sublittoral ecology of West Island, South Australia: 2. The association between hydroids and algal substrate. *Trans. R. Soc. S. Aust.* **94**, 139-146.
- & WORMSLEY, H. B. S. (1976) The sublittoral algal and seagrass ecology of St Francis Island, South Australia. *Ibid.* **100**, 177-191.
- SPENCER, W. B. (1892) On the structure of *Cornutha fusca* (Gray). *Trans. R. Soc. Vic.* **2**, 8-24.
- SUSPICE, D. A. & WATSON, J. E. (1987) Associations between pycnogonids and hydroids pp. 215-226. In J. Bouillon, F. Boero, F. Ciogna & Cornelius, P.F.S. (Eds), "Modern Trends in the Systematics, Ecology and Evolution of Hydroids and Hydromedusae." Clarendon Press, Oxford.
- SUCHOW, E. (1909) Hydroidpolypen der japanischen Ostküste. I. Teil. Athecata und Plumularidae. in Döllén, F. Beiträge zur Naturgeschichte Ostasiens. *Abh., Math. Phys. Kl. Kön. Bayer. Akad. Wiss.* **1**, 1-111.
- (1913) Hydroidpolypen der japanischen Ostküste. II. Teil. Campanularidae, Haleciidae, Lafoeidae, Campanulimidae und Sertulariidae, nebst Ergänzungen zu den Athecata und Plumularidae. in Döllén, F. Beiträge zur Naturgeschichte Ostasiens. *Ibid.* suppl. **3**, 1-162.
- (1919) Zur Kenntnis der Hydroidentfauna des Mittelmeeres, Amerikas und anderer Gebiete, nebst Angaben über einige Kirchenpauer'sche Typen von Plumulariden. *Zool. Jb. Syst.* **42**, 1-172.
- (1921) Neue Genera und Species von Hydrozoen und anderen Evertébraten. *Arch. Naturgesch.* **87**, 248-265.
- (1921) Ueber Hydroiden der Deutschen Tielsee-Expedition, nebst Bemerkungen über einige andre Formen. *Zool. Anz.* **53**, 223-236.
- (1922) Zur Systematik der Hydrozoen, Stromatoporen, Siphonophoren, Anthozoen und Ctenophoren. *Arch. Naturgesch.* **88**, 141-155.
- (1923) Die Hydroidentfauna der japanischen Region. *J. Coll. Sci. imp. Univ. Tokyo*, **44**, 1-23.
- (1923) Zur Kenntnis der Hydroidentfauna des Mittelmeeres, Amerikas und anderer Gebiete. II. *Zool. Jb. Syst.* **47**, 29-270.
- (1924) Diagnosen neuer Hydroiden aus Australien. *Zool. Anz.* **59**, 57-69.
- (1925) Hydroiden von West- und Südwestaustralien nach den Sammlungen von Prof. Dr. Michaelsen und Prof. Dr. Hartmeyer. *Zool. Jb. Syst.* **50**, 191-270.

- _____ & Müller H. C. (1923) Hydroiden von den Ari-Inseln. *Abh. Senckenb. naturf. Ges.* **35**, 459-478.
- SHIMANJANS, S. D. (1979) Gidroidy vnd antarktika i subantarktika. In: Rezul'aty Biologicheskikh Issledovaniy Sovetskikh Antarkticheskikh Ekspeditsii, 6. *Issled. Fanny Murei* **22**, 4-99.
- STRANKS, T. N. (1993) Catalogue of recent Cnidaria type specimens in the Museum of Victoria. *Oce. Papers Mus. Victoria* **6**, 1-26.
- THOMPSON, D. A. W. (1879) On some new and rare hydroid zoophytes (Sertulariidae and Thuriariidae) from Australia and New Zealand. *Ann. Mag. nat. Hist.* **3**, 97-114.
- TOTTEN, A. K. (1930) Coelenterata Part V - Hydroids. *Nat. Hist. Rep. Br. Antart. Terra Nova Exped.* **5**: 131-252.
- TREBILCOCK, R. E. (1928) Notes on New Zealand Hydroids. *Proc. R. Soc. Vict.* **41**, 1-31.
- VRYSOORT, W. (1946) Exotic hydroids in the collections of the Rijksmuseum van Natuurlijke Historie and the Zoological Museum at Amsterdam. *Zool. Meded. Leiden* **26**, 287-351.
- _____ (1959) The Hydroids of the tropical west coast of Africa. *Atlantide Rep.* **5**, 211-325.
- _____ (1962) Redescription of *Solanderia gracilis* Duchassaing & Michelin, 1846, and general notes on the family Solanderiidae (Coelenterata: Hydrozoa). *Bull. mar. Sci. Gulf Caribb.* **12**, 508-542.
- _____ (1968) Report on a collection of Hydroids from the Caribbean region, including an annotated checklist of Caribbean hydroids. *Zool. Verh. Leiden* **92**, 1-124.
- _____ (1966) Skeletal structure in the Solanderiidae and its bearing on hydroid classification. *Sympos. Zool. Soc. Lond.*, **16**, 373-396.
- _____ (1972) Hydroids from submarine cliffs near Arthur Harbour, Palmer Archipelago, Antarctica. *Zool. Meded. Leiden* **47**, 337-357.
- _____ (1987) Evaluation of taxonomic characters in the Hydroids, particularly in the Thecata (-Leptomedusae), pp. 83-103 In Bouillon, J., Boero, F., Cicogna, F. & Cornelius, P.F.S. (Eds). "Modern Trends in the Systematics, Ecology and Evolution of Hydroids and Hydromedusae" (Clarendon Press, Oxford).
- _____ (1993) Cnidaria, Hydrozoa, Hydroids: Hydroids from the Western Pacific (Philippines, Indonesia and New Caledonia) I. Sertulariidae (Part I). In Résultats des campagnes MUSORSTOM, 11. *Mém. Mus. Nat. Hist. Nat. Paris, Zool.* **158**, 89-298.
- _____ & Vasseur, P. (1977) Hydroids from French Polynesia with notes on distribution and ecology. *Zool. Verh. Leiden* **159**, 1-98.
- WATSON, J. E. (1969) *Scorobria*, a new hydroid genus from South Australian waters. *Trans. R. Soc. S. Aust.* **93**, 111-116.
- _____ (1973) Hydroids. Pearson Island Expedition 9. *Ibid.* **97**, 153-200.
- _____ (1980) The identity of two tubularian hydroids from Australia with a description and observations on the reproduction of *Ralpharia magnifica* gen. et sp. nov. *Mem. nat. Mus. Vict.* **41**, 54-60.
- _____ (1982) Hydroids (Class Hydrozoa), pp. 77-115 In Shepherd, S. A. & Thomas, I. M. (Eds). "Marine Invertebrates of Southern Australia. Part 1" (Government Printer, South Australia)
- _____ (1996) Distribution and biogeographic relationships of the hydroid fauna of the Australian west coast: a preliminary account. In Piramo, S., Boero, F., Bouillon, J., Cornelius, P. F. S. & Gili, J. M., (Eds). "Advances in Hydrozoan Biology" *Sciem. mar.* **60**, 75-83.
- _____ (1997) The hydroid fauna of the Houtman Abrolhos Islands, Western Australia pp. 503-546 In Wells, F. T. (Ed.). "Proceedings of the Seventh International Marine Biological Workshop. The Marine Flora and Fauna of the Houtman Abrolhos Islands, Western Australia" (Western Australian Museum, Perth).
- _____ (2000) Hydroids (Hydrozoa: Leptothecatae) from the Beagle Gulf and Darwin Harbour, northern Australia. *The Beagle, Rec. Mus. Art Gall. N.T.* **16**, 1-82.
- _____ (2002) Hydroids (Cnidaria: Hydrozoa) from southern Queensland. *Mem. Mus. Vict.* **59**, 337-354.
- _____ & MANNING, D. F. (1999) Hydroids from Ricketts Point and Black Rock, Victoria. *Vict. Nat.* **116**, 108-110.
- _____ & UTHSON, H. (1971) Occurrence of *Solanderia fusca* (Gray, 1868) (Hydrozoa) in Port Phillip Bay, Victoria. *Mem. nat. Mus. Vict.* **32**, 19-20.
- WHITTING, T. (1889) List of the marine and fresh-water invertebrate fauna of Port Jackson J. *Proc. R. Soc. N.S.W.* **23**, 163-323.
- YAMADA, M. (1959) Hydroid fauna of Japanese and its adjacent waters. *Publs Akkeshi mar. biol. Sta.* **9**, 1-101.
- _____ (1965) Marine hydroids from Greece. *Publ. Seto mar. biol. Lab.* **12**, 359-362.